SPECIFIED GAS EMITTERS REGULATION

TECHNICAL GUIDANCE DOCUMENT FOR 2007 SPECIFIED GAS COMPLIANCE REPORTS

MARCH 11, 2007

Version 1.2

Alberta ENVIRONMENT

ALBERTANS & CLIMATE CHANGE

Disclaimer:
The information provided in this document is intended as guidance only. This document is not a substitute for the law. Please consult the *Specified Gas Emitters Regulation* and the legislation for all purposes of interpreting and applying the law. In the event that there is a difference between this document and the *Specified Gas Emitters Regulation* or legislation, the *Specified Gas Emitters Regulation* or the legislation prevail.

Any comments or suggestions regarding the content of this document may be directed to:

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Process for Discussion of Compliance Report Related Questions:

Please submit any questions relating to the 2007 Specified Gas Compliance Report to: AENV.GHG@gov.ab.ca. This will ensure inquiries are tracked and addressed in the most efficient manner.

Please include the following in your submission (as applicable):

- The nature of the request (questions around true-up, compliance period, intensity, etc)
- Any specifics you would like the Department to consider (in particular, the source of the issue, concern, etc.).
- Whether the issue is likely a common issue with similar facilities in your sector.

An Alberta Environment representative will then either answer your question via e-mail or contact you to further discuss your question.

This process is not intended to serve as a pre-approval or decision relating to requirements under the *Specified Gas Emitters Regulation (Regulation)*. It is intended to address issues in support of completing a 2007 Specified Gas Compliance Report. The final decision on matters rests with the Director under the *Regulation*.

Should you wish to make a proposal to the Director related to your Compliance Report, provide both scenarios with your proposal: method as per *Specified Gas Emitters Regulation* and proposed alternate method including evidence as to why the method in the *Specified Gas Emitters Regulation* is not appropriate. Also include any relevant emissions, production and intensity information with your proposal.

Please note that in any event your 2007 Specified Gas Compliance Report must be submitted to the Department by March 31, 2008.

Table of Contents

Process for Discussion of Compliance Report Related Questions: iii

Table of Contents v

List of Tables vi

List of Figures vi

Abbreviations vii

1.0 Purpose of the Document 1

2.0 Introduction 1

3.0 Compliance Report Process 2

4.0 Estimation and Reporting of Specified Gases 5

4.1 Source Categories 6

4.2 Reporting of Hydrofluorocarbons (HFC), Perfluorocarbons (PFC) and Sulphur hexafluoride (SF_6) 10

4.3 Emission Estimation Methodologies 12

5.0 Calculating Emissions, Production and Intensity 16

5.1 Threshold Calculation 16

5.2 Calculating Total Half Year Emissions (THYE) 16

5.3 Calculating Total Half Year Production (THYP) 16

5.4 Calculation of Net Emissions Intensity 17

5.5 Net Emissions Intensity Limit Calculation 18

5.6 Credit Calculation 18

5.7 Compliance Calculation 19

6.0 Compliance Options 20

6.1 Facility Improvements 20

6.2 Climate Change and Emissions Management Fund 21

6.3 Offsets 22

6.4 Emissions Performance Credits 24

7.0 Verification by Third Party Auditor 25

7.1 Verification Fundamentals 26

7.2 Qualifications of the Third Party Auditor 31

7.3 Verification Process 32

7.4 Statement of Verification 45

7.5 Peer Review Process ..... **Error! Bookmark not defined.**

7.6 Subsequent Events 48

8.0 Completing the Compliance Report 49

8.1 Instructions 49

8.2 Section A: Administrative Information 49

8.3 Section B: Emissions, Production and Intensity Information 53

8.4 Section C: Calculation Methods 58

8.5 Section D: Cogeneration Information 60

8.6 Section E: Compliance 61

8.7 Section F: Additional Comments 65

8.8 Section G: Third Party Auditor Information 66

8.9 Submission Information 66

8.10 Conflict-of-Interest Checklist 67
8.11 Statement of Qualification 67
8.12 Statement of Verification 67
8.13 Statement of Certification 68
8.14 2007 Emission Performance Credit Request Form 68

9.0 Data Confidentiality and Access to Information 69
9.1 Request for Confidentiality 69
9.2 Access to Compliance Report Information 70

10.0 Cogeneration 71
10.1 Cogeneration Reporting Requirements 72
10.2 Greenhouse Gas Emissions from Cogeneration 73
10.3 Deemed Greenhouse Gas Emissions for Electricity Generation 73
10.4 Greenhouse Gas Emissions for Heat Generation 74
10.5 Net Emissions Intensities 74
10.6 Significant Change in Cogeneration Unit Operation 76

Glossary of Terms 77

References 82

List of Tables

Table 1: Specified Gases and Gas Species Subject to the *Regulation* 5

Table 2: Summary of Reporting Requirements by Source Category and Specified Gas. 6

Table 3: Relative Accuracy of Emission Estimation Methodologies 12

Table 4: Emission Calculation Methods Acceptable to Alberta Environment 14

Table 5: Facility Reduction Targets 18

Table 6: Example Verification Procedures 40

Table 7: Schedule of Verification Procedures and Findings 42

List of Figures

Figure 1: Compliance Report Process for the *Specified Gas Emitters Program* 4

Figure 2: Suggested Process for Engaging a Third Party Auditor 33

Figure 3: Verification Planning Process. 36

Figure 4: Process to Complete the Verification 44

Figure 5: Possible Verification Outcomes 45

Figure 6: Confidentiality Process for the *Specified Gas Emitters Program* 70

Figure 7: Process for Requesting Non-Confidential Information Reported Under the *Specified Gas Emitters Regulation* 71

Abbreviations

AENV	Alberta Environment
BEI	Baseline Emissions Intensity
CH_4	Methane
C	Credits
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DUNS	Data Universal Numbering System
EPC	Emission Performance Credit
EPEA	*Environmental Protection and Enhancement Act*
EUB	Energy and Utilities Board
FC	Fund Credit
GJ	Gigajoule
GWP	Global Warming Potential
h	Hour
HFC	Hydrofluorocarbons
HHV	Higher Heating Value
IP	Industrial Process Emissions
kg	Kilogram
kj	Kilojoule
kt	Kilotonne
LHV	Lower Heating Value
MWh	Megawatt-hour
N_2O	Nitrous Oxide
N/A	Not Applicable
NEI	Net Emissions Intensity
NEIL	Net Emissions Intensity Limit
NGCC	Natural Gas Combined Cycle
NAICS	North American Industry Classification System
NPRI	National Pollutant Release Inventory
OC	Offset Credit
P	Production
PFC	Perfluorocarbons
RT	Reduction Target
SF_6	Sulphur Hexafluoride
SoC	Statement of Certification
SoQ	Statement of Qualification
SoV	Statement of Verification

TDE	Total Direct Emissions
TAE	Total Annual Emissions
THYE	Total Half Year Emissions
THYP	Total Half Year Production

1.0 Purpose of the Document

The purpose of this document is to assist the Person Responsible with completing the 2007 Specified Gas Compliance Report and to provide information on options for meeting the 2007 emissions intensity limits. This technical document also provides instructions on how to fill out the 2007 Specified Gas Compliance Report forms, and provides guidance on the tasks of the Third Party Auditor.

2.0 Introduction

The *Specified Gas Emitters Regulation* is a strategic regulation that confirms Alberta's intent to set greenhouse gas intensity limits for large emitters of greenhouse gases in Alberta. The *Regulation* is an important step in delivering on the current Alberta climate change action plan. It applies to all facilities in Alberta that emit 100,000 tonnes or more of greenhouse gas emissions in carbon dioxide equivalent (CO_2e) units in 2003 or in any year since.

Annual emissions intensity reduction

Facilities subject to the *Regulation* are required to apply for a Baseline Emissions Intensity (BEI) using a Baseline Emissions Intensity Application. The Director under the *Regulation* will use the Baseline Application to set the BEI for the facility. A Net Emissions Intensity Limit will be applied to the facility's BEI. This Limit, or reduction target, ranges from 2-12% depending on the number of years the facility has been in commercial operation.

Under the *Regulation*, facilities are designated as established and new depending on the number of years of commercial operation. **Established** facilities are those that completed their first year of commercial operation before January 1, 2000, or that have completed eight years of commercial operation. The BEI for these facilities is based on the facility's average emissions intensity for 2003-2005. These facilities are required to reduce their Net Emissions Intensity to 88% of their BEI. This is a 12% reduction off their BEI value.

New facilities are those facilities that completed their first year of commercial operation on or after December 31, 2000 and have completed less than eight years of commercial operation. The BEI for new facilities is based on the facility's third year of commercial operation. These facilities are required to reduce their Net Emissions Intensity starting with their fourth year of commercial operation. They must reduce their BEI by 2% per year until the full 12% reduction target has been achieved.

Options to meet emissions intensity reduction targets

If the Net Emissions Intensity Limit is not met through improvements to a facility's operations, the facility may utilize the following compliance tools:

1. Climate Change and Emissions Management Fund (the Fund): Facilities pay $15 per tonne of CO_2e (Fund Credits) into the Fund to meet reduction requirements.

2. Alberta based offsets: Facilities can purchase Emission Offsets generated from projects by facilities not subject to the *Regulation*. The offsets must be from Alberta-based projects and have been generated after January 1, 2002.
3. Emissions Performance Credits: A facility may purchase Emission Performance Credits from a different Alberta facility that beat its reduction target.

If a facility reduces its Net Emissions Intensity below its Net Emissions Intensity Limit, the facility can generate Emission Performance Credits (EPC). These EPCs can be banked, or sold to other Alberta facilities that have not met their emissions target. These credits can only be used once and must be retired after they are used.

3.0 Compliance Report Process

The Compliance Report process involves the following steps:

1. Determine if the facility is "regular" or "stand-alone cogen". Regular facilities are those facilities that do not have a stand-alone cogen facility.

2. Complete the appropriate 2007 Specified Gas Compliance Report form. Two different Compliance Report forms are provided, one for regular facilities and one for stand-alone cogeneration facilities.

3. Meet the 2007 Net Emissions Intensity Limit through improvements to the facility; the purchase of Fund Credits, or Offset Credits; or through the use or purchase of Emission Performance Credits.

4. Submit the following completed documents to Alberta Environment by March 31, 2008:

    - Third Party verified 2007 Specified Gas Compliance Report (Excel format, named *Facility ID_Facility Name_CR2007.xls*)
    - Third Party Auditor's Report (PDF format, named *Facility ID_Facility Name_AudRepCR2007.pdf*)
    - The signed Conflict-of-Interest Checklist,
    - The signed Statement of Certification form,
    - The signed Statement of Qualification form,
    - The signed Statement of Verification form,
    - If applicable, 2007 Emission Performance Credit Request Form,
    - If applicable, a copy of the Fund Credit Purchase Receipt,
    - If applicable, a copy of the Offset Credit Purchase Receipt(s),
    - If applicable, a copy of the Offset Credit GHG Assertion and Statement of Verification,
    - If applicable, a copy of the Offset Credit Retirement Receipt,
    - If applicable, a copy of the EPC Purchase Receipt(s), and
    - If required, the Confidentiality Request.

Additional supporting documents that are not specified above (e.g.: detailed emissions calculations, supporting data, etc.) must be made available to Alberta Environment upon request.

The Compliance Report form and the Third Party Auditor's Report must be submitted electronically to Alberta Environment via e-mail to:

SGR@gov.ab.ca

For administrative purposes, e-mail the Compliance Report and Third Party Auditor's Report for one facility at a time. A confirmation e-mail will be sent stating that the Compliance Report and Third Party Auditor's Report were received.

The Compliance Report and Third Party Auditor's Report may also be submitted to Alberta Environment on a CD or DVD. If one person is the Person Responsible for several facilities covered under the *Regulation*, the Compliance Report and Third Party Auditor's Reports for several facilities may be added to one CD or DVD and sent by mail or courier to Alberta Environment at the address below.

5. Originals (not photocopies) of the signed Statement of Certification, Statement of Qualification, Statement of Verification and Emission Performance Credit Request (if applicable) must be submitted via mail or courier to the address below.

6. Copies of true-up documents (Fund Credit Purchase Receipt, Offset Credit Purchase Receipt, Offset Credit GHG Assertion and Statement of Verification, Offset Credit Retirement Receipt, EPC Purchase Receipt, etc) must be submitted by mail or courier to the address below.

7. Confidentiality requests where required, including the justification and supporting documentation, must be submitted by March 31, 2008 to the address below.

8. Documents, excluding those submitted by email, must be sent to:

   Director
   Alberta Environment
   12th Floor, Oxbridge Place
   9820-106 Street
   Edmonton, Alberta
   T5K 2J6

Note: All documents must be submitted to Alberta Environment on or before March 31, 2008.

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9. Once the Compliance Report and the other required documents have been received, Alberta Environment will perform compliance checks on the submitted documents.

   If a confidentiality request has been submitted, the facility will receive notification of the Director's decision on the request within 150 days of the submission date. The Director may ask for additional information to evaluate the Compliance Report, and confidentiality request if submitted.

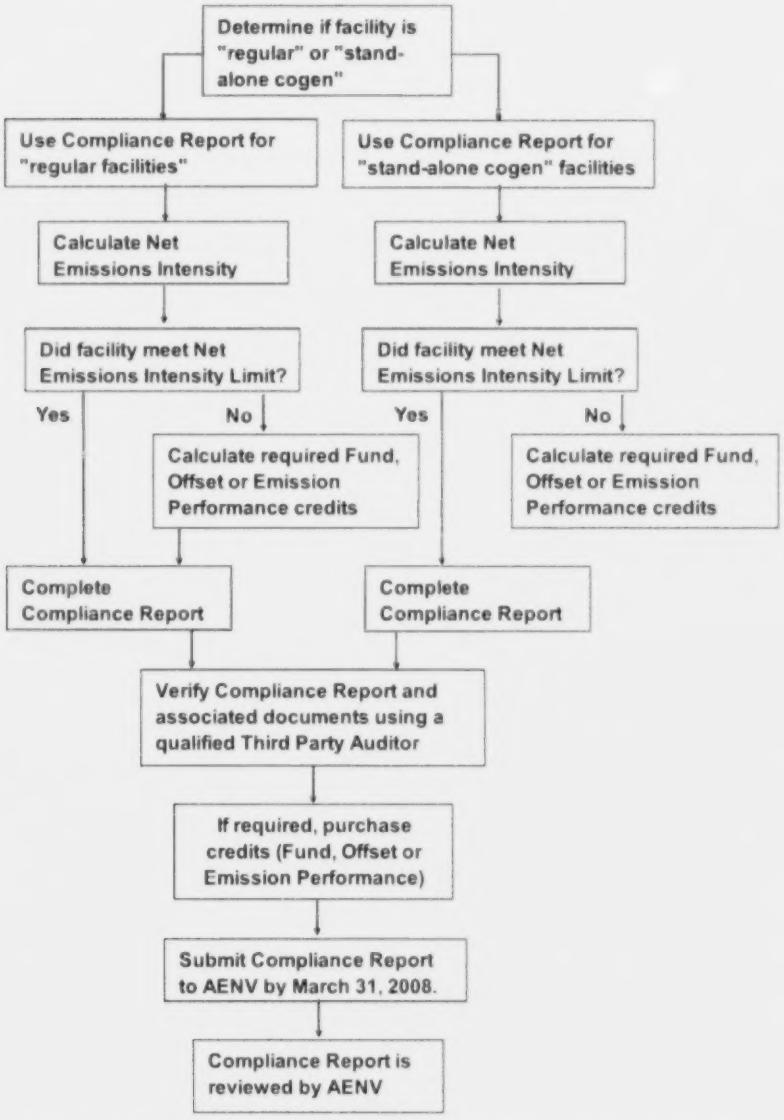
Determine if facility is "regular" or "stand-alone cogen"
Use Compliance Report for "regular facilities"
Use Compliance Report for "stand-alone cogen" facilities
Calculate Net Emissions Intensity
Calculate Net Emissions Intensity
Did facility meet Net Emissions Intensity Limit?
Did facility meet Net Emissions Intensity Limit?
Yes
No
Yes
No
Calculate required Fund, Offset or Emission Performance credits
Calculate required Fund, Offset or Emission Performance credits
Complete Compliance Report
Complete Compliance Report
Verify Compliance Report and associated documents using a qualified Third Party Auditor
If required, purchase credits (Fund, Offset or Emission Performance)
Submit Compliance Report to AENV by March 31, 2008.
Compliance Report is reviewed by AENV

Figure 1: Compliance Report Process for the *Specified Gas Emitters Program*.

4.0 Estimation and Reporting of Specified Gases

The *Specified Gas Emitters Regulation* applies to any facility that releases 100,000 tonnes or more of CO_2e based on the sum of direct emissions of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulphur hexafluoride (SF_6). These regulated emissions are multiplied by their 100-year global warming potential (listed in Table 1) to determine their CO_2e value.

Table 1: Specified Gases and Gas Species Subject to the *Regulation*.

Specified Gas	Formula	100-year GWP
Carbon dioxide	CO_2	1
Methane	CH_4	21
Nitrous Oxide	N_2O	310
Sulphur Hexafluoride	SF_6	23900
Perfluorocarbons (PFC)		
Perfluoromethane	CF_4	6500
Perfluoroethane	C_2F_6	9200
Perfluoropropane	C_3F_8	7000
Perfluorobutane	C_4F_{10}	7000
Perfluorocyclobutane	c-C_4F_8	8700
Perfluoropentane	C_5F_{12}	7500
Perfluorohexane	C_6F_{14}	7400
Hydrofluorocarbons (HFC)		
HFC-23	CHF_3	11700
HFC-32	CH_2F_2	650
HFC-41	CH_3F	150
HFC-43-10mee	$C_5H_2F_{10}$ (structure: $CF_3CHFCHFCF_2CF_3$)	1300
HFC-125	C_2HF_5	2800
HFC-134	$C_2H_2F_4$ (structure: CHF_2CHF_2)	1000
HFC-134a	$C_2H_2F_4$ (structure: CH_2FCF_3)	1300
HFC-143	$C_2H_3F_3$ (structure: CHF_2CH_2F)	300
HFC-143a	$C_2H_3F_3$ (structure: CF_3CH_3)	3800
HFC-152a	$C_2H_4F_2$ (structure: CH_3CHF_2)	140
HFC-227ea	C_3HF_7 (structure: CF_3CHFCF_3)	2900
HFC-236fa	$C_3H_2F_6$ (structure: $CF_3CH_2CF_3$)	6300
HFC-245ca	$C_3H_3F_5$ (structure: $CH_2FCF_2CHF_2$)	560

4.1 Source Categories

The reporter must disaggregate and report emissions of CO_2, CH_4, N_2O, HFC, PFC, and SF_6 according to the following source categories:

- Stationary Fuel Combustion
- Industrial Process
- Venting
- Flaring
- Other Fugitive
- On-site Transportation
- Waste and Wastewater
- Vented Raw Gas
- CO_2 Emissions from the Combustion of Biomass
- CO_2 Emissions from the Aerobic Decomposition of Waste

Table 2: Summary of Reporting Requirements by Source Category and Specified Gas.

Source Category	Specified Gas	Reported	Total Direct Emissions (TDE)	Total Half Year Emissions (THYE)
Stationary Fuel Combustion (Includes CH_4 and N_2O emissions from the combustion of biomass)	CO_2, CH_4, N_2O	✓	✓	✓
Industrial Process	All*	✓	✓	×
Venting (Does not include vented raw gas)	CO_2, CH_4, N_2O	✓	✓	✓
Flaring (Does not include flaring of landfill gas)	CO_2, CH_4, N_2O	✓	✓	✓
Other Fugitive	CO_2, CH_4, N_2O	✓	✓	✓
Vented Raw Gas	CO_2	✓	✓	✓
Waste and Wastewater (Includes emissions from incineration of non-biomass waste and CH_4 & N_2O emissions from decomposition of waste and CH_4 & N_2O emissions from flaring of landfill gas)	CO_2, CH_4, N_2O	✓	✓	✓
On-site Transportation	CO_2, CH_4, N_2O	✓	✓	✓
CO_2 Emissions from the Combustion of Biomass (Includes CO_2 emissions from combustion of biomass, incineration of waste biomass and flaring of landfill gas)	CO_2	✓	✓	×
CO_2 Emissions from the Aerobic Decomposition of Waste	CO_2	✓	✓	×

* Note: HFC, PFC and SF_6 emissions from industrial product use only are included in the threshold and baseline calculations.

Sections 4.1.1 to 4.1.10 provide additional information on each source category.

4.1.1 Stationary Fuel Combustion

Stationary fuel combustion emissions are direct emissions resulting from non-vehicular combustion of fossil or biomass fuel at the facility for the purpose of energy production (i.e. to generate electricity, heat or steam). This category does not include CO_2 emissions from the combustion of biomass, but does include N_2O and CH_4 emissions from biomass combustion.

Stationary fuel combustion is a common source of greenhouse gas emissions and is produced in most industrial sectors. The stationary fuel combustion source category includes on-site waste incineration if the waste is combusted for the purpose of energy production. Emissions from waste incineration, when used as a disposal method, must be included in the Waste and Wastewater source category.

Note: *Combustion of Biomass: CO_2 Emissions from the Combustion of Biomass must be reported in a separate source category (CO_2 Emissions from the Combustion of Biomass) and included in the Total Direct Emissions calculations, but are not included in the Total Half Year Emissions (THYE) calculations for the facility. N_2O and CH_4 emissions from biomass combustion must be reported in the Stationary Fuel Combustion source category and included in the THYE calculations.*

4.1.2 Industrial Process

Industrial process emissions are direct emissions from an industrial process involving chemical or physical reactions other than combustion, and where the primary purpose of the industrial process is not energy production. This includes mineral, metal and chemical production. This source category is more sector-specific than stationary fuel combustion and is not found in all industrial sectors.

Note: *Where industrial process emissions are produced in combination with emissions from fuel combustion for energy purposes, the emissions must be included in the source category for the primary purpose of the activity. If the primary purpose of the activity is to generate energy, the emissions must be included in the Stationary Fuel Combustion source category. If the primary purpose of the activity is process-related, then the emissions must be included in the Industrial Process source category.*

Note: *Industrial process emissions are excluded from THYE; however, the Third Party Auditor must still examine the sources, estimation methods and calculations for these emissions.*

4.1.3 Venting

Venting emissions are direct emissions from intentional releases to the atmosphere of a waste gas or liquid stream and include without limitation: emissions of casing gas; treater; stabilizer; dehydrator off-gas; blanket gas and emissions from pneumatic devices, which use natural gas as a driver; compressor start-up; pipeline and other blowdowns; and metering and regulation station control loops. Vented raw gas emissions are not included in this source category.

4.1.4 Flaring

Flaring emissions are direct emissions from the controlled combustion of a gas or liquid stream produced on site not for the purpose of energy production and including without limitation: emissions arising from waste petroleum incineration; hazardous emissions prevention systems (whether in pilot or active mode); well testing; natural gas gathering systems; processing plant operations; crude oil production; pipeline operations; petroleum refining; and chemical fertilizer and steel production.

CO_2 emissions from the combustion of landfill gas are not included in flaring emissions, but are included in the CO_2 Emissions from the Combustion of Biomass source category. CH_4 and N_2O emissions from the combustion of landfill gas must be reported in the Waste and Wastewater source category.

4.1.5 Other Fugitive

Other fugitive emissions are direct emissions that do not fall under stationary fuel combustion emissions, industrial process emissions, venting emissions, flaring emissions, on-site transportation emissions, waste and wastewater emissions, vented raw gas emissions, CO_2 emissions from the combustion of biomass, or CO_2 emissions from aerobic decomposition, and include without limitation: intentional or unintentional releases of gases arising from the production, processing, transmission, storage, and use of solid, liquid or gaseous fuels.

Emissions from other fugitive sources are generally the result of the handling or processing of various types of fuel in the fossil fuel industry. Other fugitive sources include leaks from natural gas transmission lines and processing plants, accidental releases from oil and gas wells, and releases from the mining and handling of coal.

4.1.6 Vented Raw Gas

Vented raw gas emissions are direct emissions of carbon dioxide that is recoverable, or is recoverable at a well from an underground reservoir, and that is gaseous at conditions under which its volume is measured or estimated. This source category includes, but is not limited to CO_2 emissions vented from gas sweetening and formation gas.

4.1.7 Waste and Wastewater

This source category refers to direct emissions from on-site waste disposal and waste or wastewater treatment. It may include without limitation sources of emissions from on-site waste disposal, and waste or wastewater treatment at a facility such as landfilling of solid waste, flaring of landfill gas, treatment of liquid waste, and waste incineration.

***Note**: Emissions resulting from waste to energy operations where waste materials are used directly as a fuel or converted to fuel must be included in the Stationary Fuel Combustion source category.*

***Note:** CO_2 emissions from flaring of landfill gas must be reported in the CO_2 Emissions from the Combustion of Biomass source category as landfill gas is considered a biomass material and included in Total Direct Emissions (TDE), but not included in the calculation of Total Half Year Emissions (THYE) for the facility. CH_4 and N_2O emissions from landfill gas flaring must be reported in the Waste and Wastewater source category and included in the TDE and THYE calculations for the facility.*

4.1.8 On-site Transportation

On-site transportation emissions are direct emissions resulting from fuel combustion in machinery used for the on-site transportation of products and materials integral to the production process.

Examples are: the transportation of raw or intermediate products and materials within the production process; equipment used at an oil sands operation to mine and/or move materials to subsequent on-site processing; or equipment used at above or below ground mining operations to mine and/or move mined materials or other intermediate products or materials to different on-site production processes.

4.1.9 CO_2 Emissions from Biomass Combustion

Carbon dioxide emissions from the combustion of biomass are direct emissions from the combustion of plant materials, animal waste or any product made of either of these, and includes without limitation: wood and wood products; charcoal; agricultural residues; and wastes including organic material above and below ground, both living and dead, such as trees, crops, grasses, tree litter, roots, municipal and industrial wastes where the organic material is biological in origin; landfill gas; bio-alcohols; black liquor; sludge gas; and animal or plant-derived oils.

For the 2007 Specified Gas Compliance Report, carbon dioxide emissions from the combustion of biomass must be calculated and included in the calculation of Total Direct Emissions (TDE), but not included in the calculation of Total Half Year Emissions (THYE) for the facility.

CH_4 and N_2O emissions from the combustion of biomass must be reported in the Stationary Fuel Combustion source category and included in the TDE and THYE calculations for the facility.

Note: *Carbon dioxide emissions from waste incineration of biomass must be reported in the CO_2 Emissions from the Combustion of Biomass source category and included in the Total Direct Emissions (TDE) calculation, but are not included in the Total Half Year Emissions (THYE) calculation for the facility. Carbon dioxide emissions from waste incineration of fossil fuel-based (non-biomass) materials must be reported in the Waste and Wastewater source category and included in TDE and THYE calculations for the facility.*

Note: *CO_2 emissions from Flaring of Landfill Gas must be reported in the CO_2 Emissions from the Combustion of Biomass source category as landfill gas is considered a biomass material. These emissions must be included in the Total Direct Emissions (TDE) calculation, but not included in the Total Half Year Emissions (THYE) calculations for the facility. The CH_4 and N_2O emissions from landfill gas flaring must be included in the Waste and Wastewater source category, and included in the facility's TDE and THYE calculations.*

Note: *CO_2 Emissions from the Combustion of Biomass are set to zero in the THYE calculations, but the sources, estimation methods, and calculations must still be examined by the Third Party Auditor.*

4.1.10 CO_2 Emissions from Aerobic Decomposition of Waste

CO_2 emissions resulting from the aerobic decomposition of biomass materials in waste must be reported and included in the Total Direct Emissions (TDE) calculation, but are not included in the Total Half Year Emissions (THYE) calculations for the facility. CH_4 and N_2O emissions from waste decomposition must be reported in the Waste and Wastewater source category, and included in the TDE and THYE calculations for the facility.

Note: *CO_2 Emissions from the Aerobic Decomposition of Waste are set to zero in the calculation of THYE but the sources, estimation methods, and calculations must still be examined by the Third Party Auditor.*

4.2 Reporting of Hydrofluorocarbons (HFC), Perfluorocarbons (PFC) and Sulphur hexafluoride (SF_6)

Emissions of HFC and PFC are reported by each individual species (see Table 1 for a list of species). The total for all sulphur hexafluoride (SF_6) emissions must be reported. Emissions of HFC, PFC and SF_6 must be reported in the 2007 Specified Gas Compliance

Report and included in the Total Direct Emissions calculations for the facility. However, emissions from industrial process sources should not be included in the Total Half Year Emissions calculations for the facility.

Note: *Reporting of HFC, PFC and SF_6 emissions is limited to industrial process and industrial product use.*

Note: *HFC, PFC and SF_6 emissions from industrial process are excluded from THYE calculations, but the Third Party Auditor must still examine all sources, estimation methods and for these gases.*

4.2.1 HFC

Hydrofluorocarbons are a series of synthetic gases that contain carbon, hydrogen and fluorine. Although emissions of hydrofluorocarbons are usually very small, species of HFC often have very large global warming potentials ranging from 140 to 11700 (see Table 1). HFC emissions sources that must be included in the Compliance Report are those resulting from industrial process and industrial product use including emissions from foam blowing and the use of HFC as a cover gas in metal production.

HFC emissions from other applications such as refrigeration, air conditioning, aerosol propellants, fire extinguishers, some solvents, etc. are not considered industrial process or industrial product use and must not be reported in the Compliance Report.

4.2.2 PFC

Perfluorocarbons are a family of industrial gases. Although emissions of perfluorocarbons are usually very small, species of PFC have significant global warming potentials, ranging from 6500 to 9200 (see Table 1). PFC emissions sources that must be included in the Compliance Report are those resulting from industrial process and industrial product use including aluminum production and foam blowing.

PFC emissions from other applications such as refrigeration, air conditioning, semiconductor manufacturing, aerosol propellants, fire extinguishers, some solvents, etc are not considered industrial process or industrial product use and must not be reported in the Compliance Report.

4.2.3 SF_6

Sulphur hexafluoride (SF_6) is a synthetic gas that is relatively inert due to its specific chemical properties. Emissions of sulphur hexafluoride are usually small, but due to its significant global warming potential of 23,900 it must be reported and included in the Total Direct Emissions for a facility. Sources of SF_6 from industrial process and industrial product use include being used as: a cover gas in magnesium smelting and casting, as foundry products in the aluminum industry, or as an insulting gas in electrical

equipment such as circuit breakers. These emissions sources must be included in the Compliance Report.

SF_6 emissions from other applications such as fire suppression, explosion protection, leak detection and electronic applications are not considered industrial process or industrial product use and must not be reported in the Compliance Report.

4.3 Emission Estimation Methodologies

There are several measurement and calculation options available for the different emission sources categories with associated levels of accuracy with the measured parameter data (e.g., fuel consumption) and the calculation method (e.g., mole balance). Alberta Environment encourages the use of data with the highest possible accuracy (see Table 3). Prioritization of effort in measurement and calculation of greenhouse gas emissions is recommended; most time and effort should be spent on the largest sources of greenhouse gas emissions.

Note: *Facilities are required to use emission estimation methodologies that are consistent with what was used in their Baseline Emissions Intensity Applications. Any changes to the emission estimation methodologies must be clearly identified and justified in section C of the 2007 Specified Gas Compliance Report.*

Table 3: Relative Accuracy of Emission Estimation Methodologies

Measured Data	Accuracy*	Calculation
Monitoring or direct measurement	Most	Mole balance with efficiency factors
Intermittent (periodic) direct measurement		Equipment-specific emission factors
Calculated based on measured surrogate parameters		Manufacturer's emission factors
Extrapolated from historical data		Models based on surrogate parameters
Estimated from design requirements		Generic emission factors
Estimated from agreements	Least	Top-down emission factors

* This is a general rule of thumb when examining measured parameters and calculations. There is overlap between the categories and under certain conditions the order of these categories will change.

The following is a description of the six measured data categories in decreasing order of accuracy:

- Monitoring or direct measurement uses Continuous Emissions Monitoring Systems (CEMS). Where greenhouse gases are directly measured, a calculation methodology does not need to be specified.
- Intermittent (periodic) direct measurements use source (stack) testing as a "snapshot measurement in time". The measurement result is then extrapolated over a period of time to determine emission values for that time period.
- Calculated based on surrogate measures uses correlations developed between measured emission rates and related parameters. This is the most common form of measurement (e.g., fuel consumption).
- Extrapolation from historic data uses past information to determine current operating conditions (e.g., runtime and loads).
- Estimates from design requirements uses design information and facility configuration to determine likely emissions values (e.g., power requirements for equipment determine fuel consumption).
- Estimates from agreements use contractual arrangements to provide a product or service to determine likely emissions values (e.g. power supplied, fuel delivered).

Alberta Environment does not recommend using a method of measurement that includes or falls below the extrapolation of historic data category unless it can be shown that this level of accuracy in the calculation will not materially effect the submission.

The following is a description of the six calculation categories in decreasing order of accuracy:

- Mole balance with efficiency factors determines an emission factor based on the mole balance of carbon between the input and the output of a source with some assumed efficiency factor.
- Equipment-specific emission factors are determined based on the measurement of the input and output of the equipment at an operating condition similar to normal operations.
- Manufacturer's emission factors are determined based on manufacturer testing.
- Models based on surrogate parameters can derive emission factors based on scientific models that do not have a parameter directly related to the emission (e.g. soil surface temperature and methane emissions from a coal pile).
- Generic emission factors based on a sample of equipment.
- Top-down emission factors based on the aggregate numbers averaged over a large population.

Alberta Environment does not recommend using a method of calculation that falls below the category of generic emission factor unless it can be shown that this level of accuracy in the measurement will not materially effect the submission.

Alberta Environment has reviewed and deemed acceptable the calculation methods listed in Table 4. Please note that these calculation methods might not cover all applicable

industries in Alberta. In situations where the required calculation is not included in Table 4, or a facility-specific method leading to an emissions estimate of higher accuracy has been developed, and the lower accuracy in the calculation using the accepted method may effect the final submission, the facility may propose a facility-specific calculation method.

Where an alternate calculation method is used, the facility must submit the method used along with the 2007 Specified Gas Compliance Report. The facility's submission must include a statement on the uncertainty associated with the calculation method and evidence that the use of the alternate proposed method resulted in an emissions estimate of higher accuracy. Alberta Environment encourages the development of sector-specific calculation methodologies and further refinement of the below calculation methods.

The calculation methods used must be consistent across all baseline and compliance years to ensure that changes in the quantities of greenhouse gas emissions for a facility between years are actual changes in the quantities of greenhouse gases released and not the result of changes in methods used to calculate/estimate the facility's emissions.

A change in the methods used may be warranted due to changes in operation, sources or other factors. In this case, the change in method and the reason for the change must be disclosed in section C of the 2007 Specified Gas Compliance Report. Please note that in some cases the Baseline Emission Intensity may have to be restated.

Table 4: Emission Calculation Methods Acceptable to Alberta Environment

Reference	Method	Stationary Fuel Combustion	Industrial Process	Fugitive	Biomass Combustion	Other (incl. Flaring and Venting, Mobile)
1	EC Sector-Specific Guidance	✓	✓			✓
2	CAPP 2005[1]	✓	✓	✓		✓
3	CAPP 2003[2]	✓	✓	✓		
4	CAPP 1999[2]	✓	✓			
5	SGA 2000[2]	✓				
6	CSA 2007	✓		✓	✓	✓
7	ICFPA 2005a[2]	✓	✓		✓	✓
8	ICFPA 2005b[2]	✓	✓		✓	✓
9	US EPA AP 42[2]	✓				
10	API 2004[2]	✓	✓	✓		✓
11	GRI-GLYCalc[2]			✓		
12	GHG Protocol	✓	✓		✓	✓
13	Landfill Protocol			✓	✓	✓

[1] These methods (or predecessors) were included in the 2003 Specified Gas Reporting Standard.

1. Environment Canada, 2003, 2004, *Sector-Specific Guidance Manuals and Protocols (Aluminum Production, Base Metals Smelting/Refining, Cement Production, Primary Iron and Steel Production, Lime Production, Primary Magnesium Production and Casting, Metal Mining)*, www.ec.gc.ca/pdb/ghg/guidance/calcu_pro_e.cfm, accessed June 14, 2007.

2. Canadian Association of Petroleum Producers (CAPP) and Clearstone Engineering, 2005, *A National Inventory of Greenhouse Gas (GHG), Criteria Air Contaminant (CAC) and Hydrogen Sulphide (H2S) Emissions by the Upstream Oil and Gas Industry, Volume 3 Methodology for Greenhouse Gases [2005-0013]* and *A National Inventory of Greenhouse Gas (GHG), Criteria Air Contaminant (CAC) and Hydrogen Sulphide (H2S) Emissions by the Upstream Oil and Gas Industry, Volume 5, Compendium of Terminology, Information Sources, etc. [2005-0015]*, www.capp.ca/default.asp?V_DOC_ID=763&SubjectID=414802, accessed June 14, 2007.

3. Canadian Association of Petroleum Producers (CAPP) and Atlus Environmental Engineering Ltd, 2003, *Calculating Greenhouse Gas Emissions [2003-0003]*, www.capp.ca/default.asp?V_DOC_ID=763&SubjectID=414802, accessed June 14, 2007.

4. Canadian Association of Petroleum Producers (CAPP) and Atlus Engineering Ltd., 1999, *CH_4 and VOC Emissions from the Canadian Upstream Oil and Gas Industry – Volume 3 [1999-0011]*, www.capp.ca/default.asp?V_DOC_ID=763&SubjectID=414802, accessed June 14, 2007.

5. SGA Energy Limited, 2000, *Emission Factors and Uncertainties for CH_4 and N_2O from Fuel Combustion*, www.sgaenergy.com/Experience/PE23.htm, accessed June 14, 2007.

6. Canadian Standards Association, 2007, *Canadian GHG Challenge Registry Guide to Entity & Facility-Based Reporting*, www.ghgregistries.ca/assets/pdf/Challenge_Guide_E.pdf, accessed June 14, 2007.

7. The International Council of Forest and Paper Associations (ICFPA), 2005, *Calculation Tools for Estimating Greenhouse Gas Emissions from Wood Product Facilities*, www.wbcsd.org/web/projects/forestry/Pulp-and-Paper-Tool-Guidance.pdf, accessed June 14, 2007.

8. The International Council of Forest and Paper Associations (ICFPA), 2005, *Calculation Tools for Estimating Greenhouse Gas Emissions from Pulp and Paper Mills*, www.wbcsd.org/web/projects/forestry/Pulp-and-Paper-Tool-Guidance.pdf, accessed June 14, 2007.

9. United States Environmental Protection Agency (US EPA), 1995 - 2007, *Compilation of Air Pollutant Emission Factors (AP 42) and supplements and updates*, www.epa.gov/ttn/chief/ap42/, accessed June 14, 2007.

10. American Petroleum Institute (API), 2004, *Compendium of Greenhouse Gas Emissions Estimations Methodologies for the Oil and Gas Industry*, www.api.org/ehs/climate/new/upload/2004_COMPENDIUM.pdf, accessed June 14, 2007.

11. Gas Technology Institute (GTI), 2000, *GRI-GLYCalc Glycol Dehydrator Emission Estimation Software*, www.gastechnology.org/webroot/app/xn/xd.aspx?it=enweb&xd=10abstractpage/12352.xml, accessed June 14, 2007.

12. World Business Council for Sustainable Development (WBCSD)/World Resources Institute (WRI), 2001 - 2007, *Calculation Tools*, www.ghgprotocol.org/templates/GHG5/layout.asp?type=p&MenuId=OTAx, accessed June 14, 2007.

13. Alberta Environment, 2007, *Landfill Gas Quantification Protocol for Alberta*.

5.0 Calculating Emissions, Production and Intensity

5.1 Threshold Calculation

Facilities that meet the emissions threshold in 2003 or any subsequent year are required to submit a Baseline Emissions Intensity Application, and annual compliance reports. Information on the threshold calculation is detailed in section 5.1 of the *Technical Guidance Document for Baseline Emissions Intensity Applications*.

5.2 Calculating Total Half Year Emissions (THYE)

Total Half Year Emissions (THYE) are defined in the *Regulation* as the Total Direct Emissions for the period July 1, 2007 to Dec 31, 2007 not including industrial process emissions. In addition, emissions from the CO_2 from the Combustion of Biomass and CO_2 emissions from the Aerobic Decomposition of Waste source categories are set to zero for the THYE calculations for the 2007 Compliance Report.

The Third Party Auditor must verify that the sources, various units, and emissions factors used are appropriate for the facility and that the calculation of full-year 2006, full-year 2007 and July 1 – December 31, 2007 emissions, including any unit conversions for the facility have been completed in a reasonable and technically defensible manner.

Note: *In addition to direct greenhouse gas emissions for July 1 – December 31, 2007, facilities are required to report and have verified direct greenhouse gas emissions for full-year 2006 and full-year 2007. This is to ensure continuity between the baseline years (2003-2005) and the first compliance reporting year (2007).*

5.3 Calculating Total Half Year Production (THYP)

Total Half Year Production (THYP) is a facility's production for the period of July 1, 2007 to December 31, 2007. Production is defined in the *Regulation* as the quantity, expressed in the applicable unit of production, of

(i) end product produced by a facility, or
(ii) any input, output or other thing specified under subsection (4) of the *Regulation*.

Subsection (4) of the *Regulation* states that:

> *If a facility* ***does not*** *produce an end product, the director may specify an input, output or other thing as the standard of measurement of production of the facility for the purposes of this Regulation.*

End product must be a product(s) that is sold in the marketplace and cannot be an intermediate item leading to an end product. The intent is to include all major production items associated with the release of greenhouse gas emissions.

Facilities must use units of production appropriate for their operation and that are accepted by the industry to which the facility belongs. All units of production must be specified in the *International System of Units (SI units)*.

The Third Party Auditor must verify that the production items (i.e.: end products) used are appropriate for the facility and that the calculation of full-year 2006, full-year 2007 and July 1 – December 31, 2007 production values, including any unit conversions for the facility, have been completed in a reasonable and technically defensible manner.

Note: *In addition to production data for July 1 – December 31, 2007, facilities are also required to report and have verified production data for full-year 2006 and full-year 2007.*

5.4 Calculation of Net Emissions Intensity

The net emissions intensity (NEI) for a regular facility is determined by calculating the ratio of total half year emissions (THYE) to total half year production (THYP) expressed in the appropriate unit of production as expressed in the following formula:

$$NEI = \frac{THYE}{THYP}$$

Where:

NEI is the net emissions intensity;

THYE is total half year emissions (July 1 – December 31, 2007);

THYP is total half year production (July 1 – December 31, 2007);

Note: *The total half year emissions (THYE) used for determining the net emissions intensity for a facility do not include emissions from industrial process (described in section 4.1.2). Also, CO_2 Emissions from Combustion of Biomass, and CO_2 Emissions from Aerobic Decomposition of Waste source categories are set to zero.*

Note: *The net emissions intensity for integrated and stand-alone cogen facilities is discussed in section 10 of this guidance document.*

5.5 Net Emissions Intensity Limit Calculation

The Net Emissions Intensity Limit for a facility subject to the *Regulation* is calculated by multiplying the appropriate reduction target for the facility by the Baseline Emissions Intensity. The reduction target for an established facility is set at a 12% reduction below the facility's approved baseline emissions intensity. Targets for new facilities (facilities that have completed their first year of commercial operation on December 31, 2000 or any subsequent year, and have completed less than eight years of commercial operation) vary depending on the number of years the facility has been in commercial operation (see Table 5). These facilities have no reduction target for their first three years of commercial operation.

The Net Emissions Intensity Limit for a facility is calculated using the following formula:

$$\text{NEIL} = BEI \times RT$$

Where:

NEIL is the Net Emissions Intensity Limit;

BEI is the Baseline Emissions Intensity for the facility; and

RT is the reduction target for the facility;

Table 5: New Facility Reduction Targets

Years of Commercial Operation	Net Emissions Intensity Limit (NEIL)	Reduction Target (%)
1	N/A	0
2	N/A	0
3	N/A	0
4	98% of BEI	2
5	96% of BEI	4
6	94% of BEI	6
7	92% of BEI	8
8	90% of BEI	10
9 or more*	88% of BEI	12*

* When a facility has been in commercial operation for eight years it is considered an "established facility" and is subject to the full 12% reduction target.

5.6 Credit Calculation

Facilities that do not meet their 2007 Net Emissions Intensity Limits will need to purchase Fund Credits, Offset Credits or Emission Performance Credits—credits generated by facilities that reduced their emissions below their reduction target—to meet their greenhouse gas emissions reduction target. These credits are described in section 6.0 of this guidance document.

The number of credits that a facility must purchase to meet its reduction target or the number of Emission Performance Credits a facility can generate is expressed in the following formula:

$$C = THYE - (NEIL \times THYP)$$

Where:

C is the number of credits that a facility must purchase to meet its reduction target or the number of Emission Performance Credits a facility can generate;

THYE is total half year emissions (July 1 – December 31, 2007);

NEIL is the 2007 net emissions intensity limit;

THYP is total half year production (July 1 – December 31, 2007);

Credits should be rounded to integer values following standard practices to obtain the appropriate number of credits for the facility. E.g.: 1.1-1.4 credits would round down to 1 credit, while 1.5-1.9 credits would round up to 2 credits.

5.7 Compliance Calculation

Determining whether a facility has met its 2007 Net Emissions Intensity Limit is done by comparing the facility's Net Emissions Intensity for the July 1 – December 2007 with the Net Emissions Intensity Limit, while taking into account the number of credits a facility has purchased. This is done using the following the formula:

$$NEI = \frac{THYE - (OC + FC + EPC)}{THYP}$$

Where:

NEI is the Net Emissions Intensity;

THYE is Total Half Year Emissions (July 1- December 31, 2007);

OC is Offsets Credits;

FC is Fund Credits;

EPC is Emission Performance Credits; and

THYP is Total Half Year Production (July 1- December 31, 2007).

6.0 Compliance Options

Facilities have several options for achieving compliance with their 2007 Net Emissions Intensity Limits. Improvements can be made to the operation/efficiency of the facility. Facilities that do not meet their Net Emissions Intensity Limits through facility improvements may also purchase Fund Credits from the Climate Change and Emissions Management Fund, Offset Credits from Alberta Offsets Registry, or Emission Performance Credits from facilities that have beaten their reduction target.

Note: *Offset Credits, Fund Credits and Emission Performance Credits are revocable licenses authorizing the Person Responsible to use the quantity of specified gas reductions from Offset Credits, Fund Credits and Emission Performance Credits to meet their Net Emissions Intensity Limits. The Specified Gas Emitters Regulation does not guarantee the availability of Offset Credits or Emission Performance Credits.*

6.1 Facility Improvements

Facilities subject to 2007 Net Emissions Intensity Limits may institute improvements to their operations to help meet their target emissions intensity. Facilities that reduce their greenhouse gas emissions relative to the amount of end product they produce will see their Total Half Year Emissions Intensity approach the Net Emissions Intensity Limit for their facility. This may not only help them meet their reduction target, but may also allow a facility to generate Emission Performance Credits if they beat their target. General descriptions of some options for facility improvements are discussed below.

Technology Improvements
Technology improvements can include adapting new technologies that increase energy efficiency, retrofitting existing equipment, adapting more efficient practices, etc to improve a facility's performance. Becoming more efficient will help a facility meet its reduction target, and will also make a facility more competitive and more productive over the long term. Technology improvements can also be made to reduce the quantity of greenhouse gas emissions that are actually released to the atmosphere.

Maintenance
Maintenance procedures can be implemented to reduce greenhouse gas emissions. Fugitive emissions can be fairly significant for some industrial operations. Fixing leaks and replacing old equipment may help facilities to meet their target intensities and will help make a facility more efficient.

Fuel Switching
The type of fuel used in combustion activities at a facility can affect the amount of greenhouse gas emissions resulting from the activity. Switching to a fuel that emits a smaller quantity of greenhouse gas per unit of energy produced can help a facility meet its intensity target.

Biomass combustion is a potential fuel option. IPCC guidelines state that CO_2 emissions from the combustion of biomass materials are sustainably produced. Accordingly, Alberta's *Specified Gas Emitters Program* has given CO_2 emissions from the combustion of biomass a zero reduction target. This means that a facility burning biomass will reduce its greenhouse gas emissions because its target will only apply to the methane and nitrous oxide emissions, rather than the CO_2, CH_4 and N_2O emissions associated with non-biomass fuel.

Cogeneration

Cogeneration is the combined production of heat for use in manufacturing processes and the production of electricity as a by-product. Electricity not used by the plant can be sold to the electricity market. Cogeneration units can improve a facility's efficiency, and provide a environmental benefits. Alberta Environment acknowledges the environmental benefits associated with the higher energy efficiencies afforded by cogeneration operations. Therefore, the reduction targets for cogeneration units are only applied to the heat production portion of the operations. See section 10.0 for more information on cogeneration.

Carbon Capture and Storage

Carbon capture and storage is an emerging technology. This technology collects greenhouse gas emissions at its release point (e.g. from a process or activity), thereby preventing it from being released to the atmosphere. This captured gas can then be piped to another operation for use or injected into a geological formation for long term storage. Geological injection of CO_2 is not considered a direct emission under the *Specified Gas Emitters Regulation*. These emissions are not reported and do not have an emissions reduction target.

Carbon capture and storage will play an increasingly important role in reducing greenhouse gas emissions in Alberta in the future.

6.2 Climate Change and Emissions Management Fund

Facilities subject to 2007 Net Emissions Intensity Limits may use Fund credits to meet their intensity target for the 2007 compliance year.

The Climate Change and Emissions Management Fund (the Fund) permits facilities that cannot meet their target to purchase Fund Credits by contributing money to the Fund. Each $15 Fund Credit equals a one tonne reduction in CO_2e under the *Specified Gas Emitters Program*. Payment for Fund Credits must be received by March 31, 2008. Credits purchased after the March 31 deadline will apply to the facility's 2008 compliance period.

Note, Fund Credits can only be used once.

Once the Person Responsible determines they need to purchase Fund Credits, they should follow the procedure below:

1. Calculate number of Fund Credits needed.
2. Calculate cost of Fund Credits ($15 per tonne CO2e).
3. Write a check for the appropriate amount, payable to "Minister of Finance".
4. Submit payment and Compliance Report worksheet E2 (Fund) to:

   Minister of Finance
   Financial Services Branch
   Alberta Environment
   6th floor, South Petroleum Plaza
   9915 - 108 Street
   Edmonton, Alberta
   T5K 2G8
5. Fund Credit Purchase Receipts will be issued within a few working days.
6. In section E2 of the 2007 Specified Gas Compliance Report, enter the "Fund Credit Receipt Number" from the stamp on the Fund Credit Purchase Receipt.
7. Submit a copy of the Fund Credit Purchase Receipt with your Compliance Report.

Note: *Companies may purchase Fund Credits for one or more of their facilities at same time by submitting a cheque for the total number of credits required. The cheque must be accompanied by completed fund credit worksheets (Compliance Report worksheet E2) for each facility requiring credits. Each fund credit worksheet will be stamped by the Financial Services Branch with a Fund Credit Receipt Number. These worksheets will function as the Fund Credit Purchase Receipts and a copy of each Fund Credit Purchase Receipt must be submitted to Alberta Environment with the facility's Compliance Report.*

Note: *If a facility does not receive its Fund Credit Purchase Receipt with the Fund Credit Receipt Number before the March 31, 2008 submission deadline, it must still submit its compliance report on time. The facility should indicate the number of credits purchased. The Fund Credit Purchase Receipt and Fund Credit Receipt Number can be forwarded to Albert Environment once they have been received. If these documents are being submitted separately, be sure to include the facility name, facility ID and approval number(s) for identification purposes.*

6.3 Offsets

Facilities subject to 2007 Net Emission Intensity Limits may use Offset Credits to meet their intensity target for the compliance year.

The *Regulation* defines Emission Offsets as a reduction in the release of specified gases expressed in tonnes of CO_2e that meets the requirements of section 7(1) of the *Regulation*, but do not include an Emission Performance Credits.

Specified gas reductions (emission offsets) generated for compliance with the *Specified Gas Emitters Regulation* must:

- occur in Alberta;
- be from an action taken that is not otherwise required by law at the time the action is initiated;
- result from actions taken on or after January 1, 2002, and occur on or after January 1, 2002;
- be real and demonstrable;
- be quantifiable and measurable either directly or by accurate estimation using replicable techniques.

Emission offsets:

- Must be held by the Person Responsible using it;
- May only be used once;
- If jointly held, each holder may only use a portion of the offset on a pro rata basis;
- Must accord with any Ministerial guidelines issued under Section 62 of the *Climate Change and Emissions Management Act*.

Offset projects must be done in accordance with Alberta Environment approved offset protocols. Offset projects must be third party verified and be registered with the Alberta Offset Registry (the Registry) administered by Carbon Offset Solutions. All tonnes of reductions must be verified before they can be sold within the Registry. Once Offset Credits are purchased, they must be retired in the Registry.

Once the Person Responsible determines they need to purchase Offset Credits, they should follow the procedure below:

1. Calculate number of Offset Credits needed.
2. Find an offset project with available credits for purchase (Alberta Offset Registry: http://www.carbonoffsetsolutions.ca/offsetregistry.html).
3. Ensure that the offset project meets the requirements for an offset project and Offset Credit.
4. Purchase the Offset Credits.
5. Have the Alberta Offset Registry retire the Offset Credits.
6. Enter the Offset Credit serial numbers (or range of numbers) used for true-up and the registry source of the credits in section E3 of the Compliance Report.
7. Submit a copy of the Offset Credit Purchase Receipt(s), Offset Credit GHG Assertion and Statement of Verification (these are obtained when credits are purchased from an offset project via the Alberta Offset Registry). Companies

must also submit a copy of the Offset Credit Retirement Receipt (this is obtained from the Alberta Offset Registry when Offset Credits are retired).

Note: *If a facility does not receive its Offset Credit Retirement Receipt before the March 31, 2008 submission deadline it must still submit its compliance report. The facility should state that the offsets have been purchased. Once the Offset Credit Retirement Receipt is obtained, please forward a copy to Alberta Environment along with the facility name, facility ID and approval number(s).*

Note: *Facilities that use Offset Credits that have changed owners one or more times must include all purchase receipts and relevant ownership documents to establish a paper trail from the credit generator to the credit owner submitting the credits for compliance purposes.*

6.3.1 Additional Information on Offsets

Specific guidance on the development of offset credit projects can be found in the *Offset Credit Project Guidance Document*, available at:

http://www3.gov.ab.ca/env/climate/docs/Guidance_Document_Alberta_Offsets.pdf

Specific guidance on the verification of offset credit projects can be found in the *Offset Credit Verification Guidance Document*, which is available at:

http://www3.gov.ab.ca/env/climate/docs/Verification_Document_Alberta_Offsets.pdf

Various offset credit project quantification protocols approved by Alberta Environment are available from:

http://www.environment.alberta.ca/1238.html

Additional information on the Alberta Offset System is available from:

http://www.carbonoffsetsolutions.ca/policyandregulation/abOffsetSystem.html

6.4 Emissions Performance Credits

Facilities subject to 2007 Net Emissions Intensity Limits may use Emission Performance Credits (EPC) to meet their intensity target. The *Specified Gas Emitters Regulation* defines "Emission Performance Credits" as a reduction in the release of specified gases expressed in tonnes of CO_2e. A valid EPC can only be used once. That is, it expires when a facility submits it for compliance purposes.

Emissions Performance Credits:

- Must be held by the Person Responsible who is using it.
- Can be held jointly.
- Remains active until it is used for compliance purposes. An EPC generated by a facility that exceeded its reduction target can be banked and used in subsequent years.
- Can be generated by one facility and then be used by another facility to help meets its reduction target.
- Must be generated before it can be used.

An Emission Performance Credit is awarded if a facility subject to the *Regulation* improves its actual intensity for a period vis-à-vis its Net Emissions Intensity Limit. This means, for a given compliance period, if a facility reduces its Net Emissions Intensity below the Net Emissions Intensity Limit, it is eligible for Emission Performance Credits.

A facility must submit a request for credits serialization along with its annual compliance report. The number of EPCs a facility is entitled to will automatically be calculated in the in the "Emission Performance Credit Request Form" of the compliance report. Serialized credits can be used for future compliance purposes.

Please make sure that the number of EPCs the facility is entitled to is valid, as they will be verified by Alberta Environment. In case of any discrepancy, the Director will decide the validity of these credits and may suggest appropriate measures if these credits are revoked or cancelled.

Note: *If the Emission Performance Credits were purchased from an external company, please submit a copy of the Emission Performance Credit Purchase Receipt and any other relevant ownership documents with the Compliance Report.*

Note: *Facilities that use Emission Performance Credits that have changed owners several times must include all purchase receipts and relevant ownership documents to establish a paper trail from the credit generator all the way to the credit owner submitting the credits for compliance purposes.*

7.0 Verification by Third Party Auditor

In accordance with Section 18 of the *Regulation*, a Person Responsible must obtain and submit independent verification of the Compliance Report to Alberta Environment. This section of the guidance document includes information regarding the fundamentals of verification and content of the Statement of Verification.

The verification process provides assurance to Alberta Environment that the reports received under the *Regulation* are reliable and of sufficient quality to determine

compliance with the Net Emissions Intensity Limits for a facility. This standard is consistent with international standards requiring independent, third party verification for greenhouse gas inventories. Alberta Environment retains full discretion with respect to the assessment of submitted 2007 Specified Gas Compliance Reports and Third Party Auditor Reports. These documents are considered information tools to support the compliance process. Compliance reports with incomplete or deficient third party auditor's reports will not be considered complete under the *Regulation* and the facility will not be in compliance with reporting requirements.

7.1 Peer Review Process

ISO14064: Part 3 clause 4.8 notes that, ISO14065 and some GHG programs require that a "peer review" be conducted. This peer review process requires that persons different from those who undertook the fieldwork (i.e. assessed the GHG Information System and its controls, the GHG data and information, and conducted the assessment against the verification criteria) perform a final evaluation of the evidence and conclusions of the verification team.

Third party verification performed by a Third Party Auditor provides an independent, third party review of a facility's data management and specified gas compliance reporting. This process provides Alberta Environment additional assurance that the there are no significant anomalies and that information reported is accurate and consistent with the requirements of the *Specified Gas Emitters Regulation.*

Alberta Environment has not pre-approved third party verifiers. Minimum qualifications are specified in the *Regulation* and in this document. The Person Responsible must identify how the Third Party Auditor satisfies the requirements of the *Regulation* and this guidance document in section G of the 2007 Specified Gas Compliance Report.

7.2 Verification Fundamentals

7.2.1 Terminology

Greenhouse gas literature and guidance use the term *verification* to describe the process in which objective third party examines or reviews an assertion such as a submission to a regulator and provides an opinion or conclusion. Accordingly, Alberta Environment has used the term verification in its *Regulation.*

While Alberta Environment has used the term Third Party Auditor to describe the third party independent review, the expectations of the Third Party Auditor are that they will perform a verification of a facility's compliance report submission. Alberta Environment will undertake a separate process to audit a number of facility compliance reports each year.

Alberta Environment notes that technical literature on audit and audit-related processes use the term *assurance* to encompass and define a range of different levels of assurance where an assurance practitioner is engaged to issue a written communication expressing a conclusion concerning a subject matter for which the accountable party is responsible.

For compliance purposes under the Specified Gas Emitters Regulation, a Third Party Auditor (verification body) is defined as a qualified person or persons that make up a verification team, which verifies and provides assurance on a facility's compliance report.

The lead auditor must sign the Statement of Qualification; however, the Statement of Verification may be signed by any individual on the team with the delegated powers to accept legal responsibility for the information provided.

7.2.2 Level of Assurance

There is a range of assurance that can be provided depending on circumstances of available information. For the purposes of this document, there are two basic types of conclusions that can be provided through an assurance service: **reasonable** and **limited assurance**.

Reasonable assurance is the highest level of assurance. This is also known as positive assurance because the conclusion reached is structured as a direct factual statement expressing the opinion of the assurance practitioner. The assurance practitioner provides a high, though not absolute, level of assurance by designing procedures that, in the assurance practitioner's professional judgment, reduce the risk of an inappropriate conclusion to a low level. Examples of procedures include: inspection, observation, enquiry, confirmation, recalculation, re-performance, and analytical procedures.

The level of assurance is also influenced by the degree of precision associated with the subject matter itself. Absolute assurance is not attainable due to factors such as: use of judgment, use of testing equipment, the inherent limitations of control, and the fact that much of the evidence available to the assurance practitioner is persuasive rather than conclusive in nature.

Limited assurance provides a moderate level of assurance. This is also known as negative assurance because the conclusion is based on identifying anomalies rather than confirming an assertion. A limited level assurance assertion is typically worded "Based on our work described in this report, nothing has come to our attention that causes us to believe that the GHG statement is not, in all material respects, in accordance with the approved quantification protocols."

Limited level assurance can often be obtained through enquiry, analytical procedures, and discussion. In the case of GHG assurance, these procedures alone are unlikely to acquire sufficient and appropriate evidence for the Auditor to come to a conclusion. Additional data systems evaluation and data testing will be required. Therefore, the procedures

applied in GHG limited assurance engagements are more extensive than those encountered in financial limited assurance engagements as illustrated in Section 7.4.3, but are not as rigorous those constituting reasonable assurance.

Note, the level of effort required to complete a verification increases with the level of assurance.

Alberta Environment requires a limited level of assurance be provided for the annual compliance report submissions; therefore, the level of effort required is less than what is required under reasonable assurance.

It is recognized that a reasonable level of assurance is generally set for assurance on public financial reports and that this would be the appropriate level of assurance for the annual compliance report as emissions reductions can be traded similar to financial commodities. However, Alberta Environment selected a limited level of assurance based on the likely quality of the greenhouse gas emissions inventories and associated data management systems.

7.2.3 Compilation

A compilation engagement is not an assurance service. Compilations focus specifically on building the submission. This would result in the auditor reviewing his/her own work, which would be a breach of independence. Please refer to Section 7.2.4 for more information on independence issues.

7.2.4 Independence

Independence is a surrogate measure for the objectivity of the auditor and is a key qualification of a Third Party Auditor. The Third Party Auditor must be able to demonstrate independence and have the appropriate systems in place to document this independence to be qualified to undertake a third party verification. There are five threats to independence that an auditor must assess before accepting a verification contract.

1. Self-interest threat: This occurs when the auditor, member of the verification team or person in the chain of command for the verification could directly benefit from a financial interest in the verification client, or where there is any other self-interest conflict with respect to the verification client. For example:

    - Owning shares of the verification client;
    - Having a close business relationship with the client;
    - Contingent fees relating to the results of the engagement;
    - Potential employment with the verification client; or
    - Undue concern about the possibility of losing the verification or other fees from the client.

2. Self-review threat: This occurs when a member of the verification team could be in a position of reviewing his or her own work. For example:

    - Involvement of the verification organization in the compilation of the data contained in the GHG assertion;
    - A verification organization member performing non-verification services that directly impinge on the client's GHG assertion, such as implementing the GHG data management system; and
    - A member of the verification team has previously been a GHG data compiler for the verification client, or was employed by the verification client in a position to exert direct and significant influence over the client's GHG assertion being reviewed.

3. Advocacy threat: This occurs when a verifying organization, member of the verification team, or person in the chain of command for the verification promotes, or is perceived to promote, a verification client's position or opinion to the point that objectivity may, or may be perceived to be, compromised. For example:

    - Dealing in, or being a promoter of, GHG credits on behalf of a verification client; and
    - Acting as an advocate on behalf of the verification client in litigation or in resolving disputes with third parties.

4. Familiarity threat: This occurs when, by virtue of a close relationship with a verification client, its directors, officer or employees, the firm, or a member of a verification engagement team, becomes too sympathetic to the client's interests. For example:

    - A person on the verification team has a close personal relationship with a person who is in a senior GHG compilation role at the verification client; and
    - Acceptance of significant gifts or hospitality from the verification client.

5. Intimidation or economic dependence threat: This occurs when a member of the verification team or a person in the chain of command is deterred from acting objectively and exercising professional scepticism by threats--actual or perceived--from the directors, officers or employees of the verification client. For example:

    - The threat of being replaced as Third Party Auditor due to a disagreement with the application of an GHG quantification protocol;
    - Fees from the verification client represent a large percentage of the overall revenues of the Third Party Auditor;

- The application of pressure to inappropriately reduce the extent of work performed in order to reduce or limit fees; and
- Threats arising from litigation with a verification client.

7.2.5 Verification Standards

There are standards for verification that the auditor must adhere to. These standards ensure a consistent level of rigour in the verification process such that a peer auditor would come to the same conclusion as the original auditor. The following is a list of appropriate standards for this *Regulation*:

- ISO 14064 Part 3 – Greenhouse Gases: Specification with guidance for the validation and verification of greenhouse gas assertions
- Standards for Assurance Engagements, Canadian Institute of Chartered Accountants (CICA) Handbook – Assurance Section 5025
- International Standard on Assurance Engagements (ISAE) 3000 - Assurance Engagements Other Than Audits or Reviews of Historical Financial Information

7.2.6 Verification Criteria

Verification criteria are benchmarks or comparison standards to which the auditor compares the GHG assertion stated in the facility's compliance report and supporting documents. They include, as appropriate:

- Alberta Environment: *Climate Change and Emissions Management Act*
- Alberta Environment: *Specified Gas Emitters Regulation*
- Alberta Environment: *Technical Guidance Document for 2007 Specified Gas Compliance Reports*
- Alberta Environment: *Technical Guidance Document for Baseline Emissions Intensity Applications (July 18, 2007)*
- Alberta Environment: *Additional Guidance on Cogeneration Facilities (October 1, 2007)*
- Other criteria as directed or required by Alberta Environment.

7.2.7 Materiality

Materiality refers to an error, omission or misrepresentation that would affect the GHG assertion stated in the annual compliance report, and could influence compliance with the Net Emissions Intensity Limit. If an uncorrected material error, omission or misrepresentation arises during verification, the Third Party Auditor cannot provide a verification report that provides assurance on the 2007 Net Emissions Intensity.

There are two types of materiality:

a) **Qualitative materiality** – refers to errors, omissions or misrepresentations of a non-numerical nature; for example, misleading presentation of circumstances.

   Determining whether a qualitative materiality discrepancy has occurred is at the professional judgement of the Third Party Auditor.

b) **Quantitative materiality** - refers to errors, omissions or misrepresentations of a numerical nature. Examples include inaccuracies in the input data, omission of sources, and inappropriate application of calculation methodology.

   Alberta Environment considers quantitative discrepancies material if they exceed 5% of the total reported GHG emissions and/or production. For implementation purposes, verifiers may choose an initial materiality level lower than 5% to ensure that they identify individual quantitative discrepancies that aggregate to a material discrepancy.

   Decisions regarding materiality should be made and documented for both the aggregate and disaggregate errors, omissions or misrepresentations acknowledging the sensitivity of the variables in question.

Note: All discrepancies, including non-material discrepancies, must be documented in the Third Party Auditor's Report.

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*Note: Facilities are required to declare **all** greenhouse gas emissions sources to Alberta Environment to establish a complete emissions profile for the facility as described in the definition of direct emissions stated in the Specified Gas Emitters Regulation. The 5% materiality threshold applies only to the Third Party Auditor's ability to sign off on the facility's baseline emissions intensity submission; not to a facility's emissions submission to Alberta Environment.*

7.3 Qualifications of the Third Party Auditor

In addition to the qualification requirements specified in the *Regulation*, criteria to assess the qualifications of a Third Party Auditor are provided in *ISO 14065 Greenhouse Gases – Requirements for Greenhouse Gas and Verification Bodies for use in Accreditation or other Forms of Recognition* (ISO 2007). ISO 14065 should be consulted as guidance for the Person Responsible for assessing qualifications of Third Party Auditors (verification body). Third Party Auditors will generally select a verification team consisting of several team members, each having specialized areas of expertise, or competency, to conduct the verification.

It is important that the verification team be competent in the following areas:

- Data audit practices and data verification standards
- Detailed knowledge of the *Specified Gas Emitters Regulation* and associated requirements

- Verification criteria and their appropriate application within the defined scope of the verification
- Technical expertise for the sector the audit team plans to operate in including:
  - The specific GHG activity and technology
  - Identification and selection of GHG sources, sinks, reservoirs
  - Quantification, monitoring and reporting, including relevant technical and sector issues
  - Situations that may affect the materiality of the GHG assertion, including typical and atypical operating conditions.

The Third Party Auditor should have the necessary infrastructure to operate as a business including, policies, finances, and quality review of products or services. In particular, there should be processes for:

- tracking independence and identifying independence issues,
- training personnel in verifications,
- assigning appropriate personnel to verification teams,
- storage and retention of working papers,
- assessing the verification process and conclusions,
- issuing verification statements and controls over the signature, and
- resolving appeals or complaints.

7.4 Verification Process

The verification process can be divided into four consecutive steps, pre-verification arrangements, planning, executing, and completing the verification.

7.4.1 Engaging a Third Party Auditor

Person Responsible is responsible for completing the compliance report and engaging a Third Party Auditor to conduct the verification of the Compliance Report. Figure 2 outlines a suggested process for engaging a Third Party Auditor.

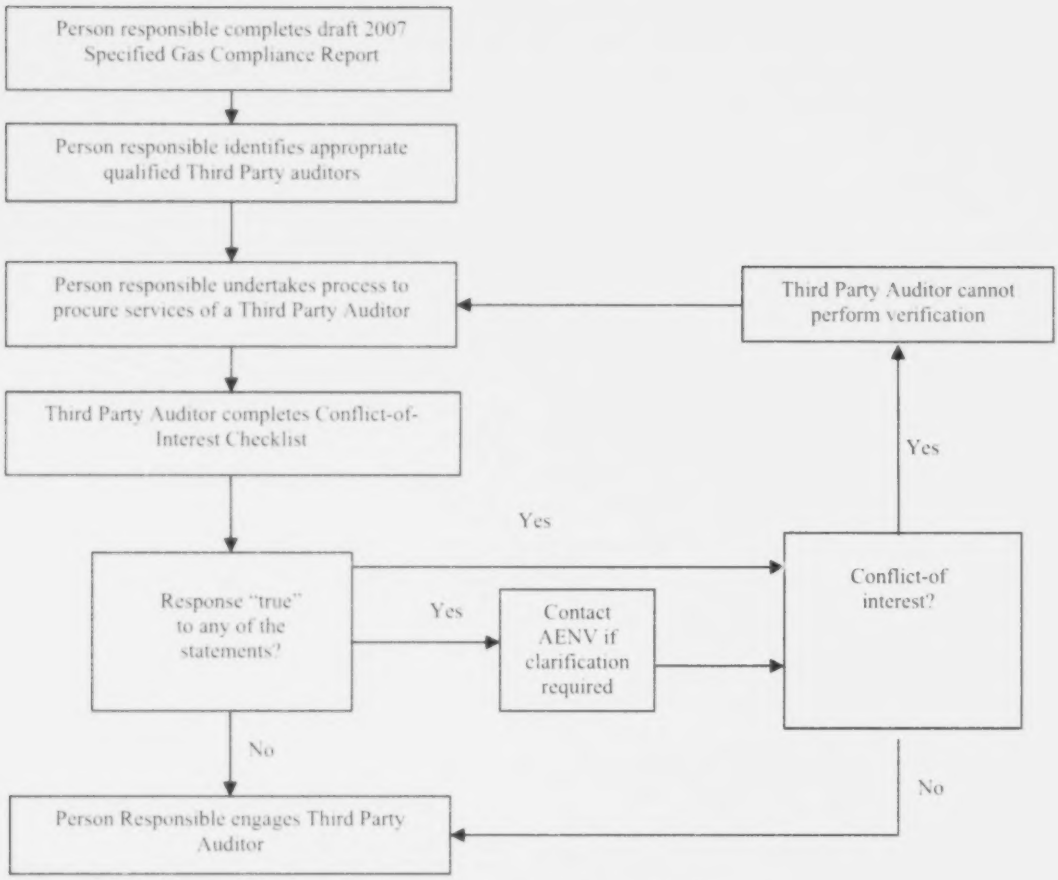
Person responsible completes draft 2007 Specified Gas Compliance Report
Person responsible identifies appropriate qualified Third Party auditors
Person responsible undertakes process to procure services of a Third Party Auditor
Third Party Auditor cannot perform verification
Third Party Auditor completes Conflict-of-Interest Checklist
Yes
Yes
Response "true" to any of the statements?
Yes
Contact AENV if clarification required
Conflict-of interest?
No
No
Person Responsible engages Third Party Auditor

Figure 2: Suggested Process for Engaging a Third Party Auditor.

Once the Person Responsible has identified a Third Party Auditor suitable to conduct the verification, s/he should implements the company's normal procurement processes to enter into a contract with the Third Party Auditor.

Note: prior to the signing of the contract both the Person Responsible and the potential Third Party Auditor need to confirm there are no actual or perceived conflicts of interest which may comprise the impartiality of the Third Party Auditor. The Conflict-of-Interest Checklist (COI) should be filled out as part of the procurement process and be submitted to Alberta Environment with the Third Party Auditor's report. Where a Third Party Auditor is utilising external resource persons on its verification team, a separate Conflict-of-Interest Checklist must be submitted for all the external persons as well as the Third Party Auditor.

Where an engagement or relationship between the Person Responsible and the Third Party Auditor may pose conflict of interest, and the Person Responsible wishes to pursue engaging this Third Party Auditor, written evidence must be provided to Alberta

Environment stating the proposed actions being taken to manage the conflict are adequate to preserve actual and perceived independence. Alberta Environment will assess all potential conflict of interest cases.

If a potential conflict of interest is of sufficient perceived or actual threat to impartiality or cannot be effectively managed, verification conducted by that Third Party Auditor will not be accepted by Alberta Environment.

The Third Party Auditor must monitor impartiality over the duration of the verification. Any identified actual or potential conflict of interest situations must be communicated to the Person Responsible and Alberta Environment.

The following is a checklist of terms that should be addressed in a contract:

- The objective of the verification
- To whom assurance is being provided (i.e.: Government of Alberta)
- What level of assurance is being provided (i.e.: limited)
- The standards to which the assurance will be provided
- Which verification criteria will be used in the verification process
- Scope of the verification (project description including gases, location, temporal aspects)
- Verification team members and their roles
- Confidentiality clause

Once there is agreement on the contract and all legal documents have been appropriately signed off, the auditor must gain an understanding of the client's facility, GHG data and GHG data management systems, and obtain the client's draft 2007 Specified Gas Compliance Report so that the auditor can design and execute an effective and economical verification.

7.4.2 Planning the Verification

Once the Third Party Auditor has been selected and engaged by the Person Responsible, the planning phase of the verification begins. In planning the verification, the Third Party Auditor must:

1. Set the objectives of the verification.
2. Assess the potential risks in the GHG data management system by
    a. Assessing the inherent and control risk associated with GHG data and data management system to determine areas for further investigation.
    b. Performing analytical testing on the draft GHG assertion to determine areas for further investigation.
3. Assess the potential magnitude of any errors, omissions and misreporting by conducting a magnitude and sensitivity analysis on the reported data to determine parameters that significantly effect the GHG assertion.

4. Set an initial quantitative materiality level for any errors, omissions or misreporting.
5. Design and document a verification plan and sampling plan that details which verification procedures should be applied to meet the objectives of the verification.

The purpose of the verification is to provide a conclusion on the the GHG assertion. The GHG assertion is a declaration, or factual and objective statement, made by Person Responsible with respect to actual performance, events or circumstances that took place during the assessment and reporting period. Verification procedures can be aligned with these criteria to ensure that they are designed appropriately and should include computation, observation, confirmation, enquiry, inspection, and analysis. The verification plan should also show the connections between the verification objectives, risks, magnitude of errors, anomalies, materiality, and procedures and should take into account the GHG data management systems as this determines the control risk for the next verification process.

For example, a objective should be to determine whether the GHG inventory is complete. The risk of the inventory being incomplete will be unknown if this is the first time the auditor has seen the procedures the client has applied to ensure the completeness of the GHG inventory. The potential magnitude of the errors, omissions and misreporting depends on the GHG source type, but can be greater than the initial quantitative materiality levels. The verification procedures for this objective could include:

1.) A site to inspect and confirm the GHG inventory.
2.) Inquiring how the client ensured the completeness of the GHG inventory.

Figure 3 provides an overview of the planning process.

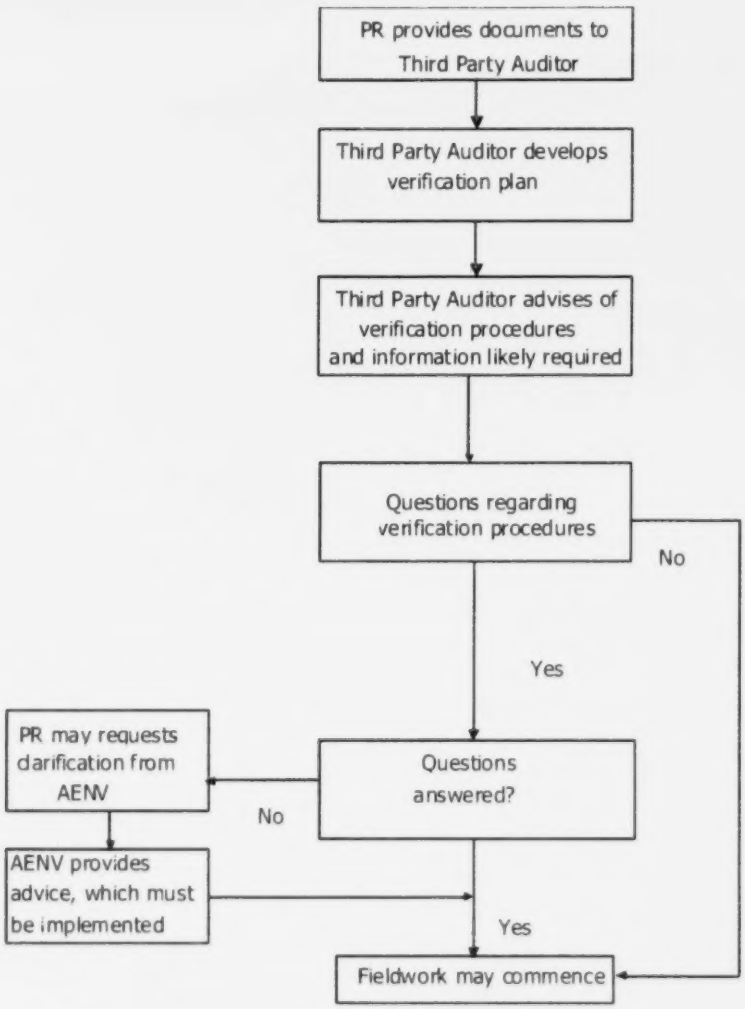
PR provides documents to Third Party Auditor
Third Party Auditor develops verification plan
Third Party Auditor advises of verification procedures and information likely required
Questions regarding verification procedures
No
Yes
PR may requests clarification from AENV
Questions answered?
No
AENV provides advice, which must be implemented
Yes
Fieldwork may commence

Figure 3: Verification Planning Process.

Person Responsible provides documents to Third Party Auditor

The Person Responsible must provide sufficient information to allow the Third Party Auditor to evaluate the audit risk[2] and assess potential sources of errors, omissions or misrepresentations. This information includes the 2007 Specified Gas Compliance Report and a description of the site process, an inventory of GHG sources, and a brief

[2] Audit risk is the likelihood that the auditor will reach the wrong opinion on the GHG assertion which is being verified. Audit risk is a function of:

- *Inherent risk* - the likelihood of a material error, omission or misrepresentation based on the complexity of the project
- *Control risk* - the likelihood the person responsible's control procedures will fail to prevent, detect or correct an error or omission.
- *Detection risk* - the probability that an auditor will not find a materiality discrepancy.

description of the GHG data management system and quantification protocol used to calculate the GHG emissions. Other documents will vary according to the specific report being examined, and will likely to include information supporting GHG emissions quantification and production.

It is the responsibility of the The Third Party Auditor to communicate to the Person Responsible the specific type of information required to complete the verification. The Person Responsible can assist the verification process by having documents and records collated and available for the Third Party Auditor. This will make the process easier and often less expensive.

Third Party Auditor develops Verification Plan
The Third Party Auditor needs to develop two planning documents, a verification plan and a sampling plan, to conduct the verification. The verification plan documents the terms of the engagement and the potential verification procedures. Note: the verification procedures will originate from anomalies encountered in the preliminary testing and risk identification. The sample plan is a type of verification procedure. It is generally developed at the site once the robustness of the data and the existence of records are known.

Both the verification plan and the sampling plan must be included in the Third Party Auditor's report.

Verification Plan
The verification plan must include:

- verification objectives,
- level of assurance,
- scope,
- verification criteria,
- verification standards,
- verification team,
- final verification schedule,
- final sampling plan,
- results of risk and magnitude assessments,
- results of the preliminary quantitative testing,
- initial quantitative materiality levels,
- draft verification procedures, and
- documentation retention requirements.

Detailed guidance on the development of a verification plan is provided in annex clause A.2.4 of ISO14064: Part 3.

The verification plan must identify verification team members who will execute the verification activities. Please note, while Third Party Auditors may hire expertise absent

from their company, outsourcing of verification activities is not permitted. Therefore, external resource personnel:

- Must be integrated into the verification team under the supervision of the lead auditor;
- Must comply with the requirements for impartiality and conflict of interest;
- Must follow the procedures and methodologies of the Third Party Auditor; and
- Should execute no more than 20% of the hours scheduled to complete the verification.

The preparation and sign off of the Third Party Auditor's Report remains the responsibility of the Third Party Auditor and may not be outsourced.

Sampling Plan

The sampling plan is a subset of the verification plan. It describes the amount and type of evidence that the Third Party Auditor requires to issue a positive verification opinion. The sampling plan is based on the level of assurance required (in this case limited) and the risk of encountering a discrepancy in the GHG data. Sampling is conducted when other verification procedures are insufficient or when it is the most efficient and effective method to investigate an anomaly or confirm the data. As it is impossible for the Third Party Auditor to examine every record to support the data in the 2007 Specified Gas Compliance Report, the sampling plan sets out the number and type of records which will be examined, and identifies and justifies the methodology used to determine these needs.

The Third Party Auditor will use a combination of risk-based (i.e. where error, omissions or misrepresentation are most likely to occur or have the greatest impact) and statistical approaches. The risk-based approach is the predominant selection method for efficiency purposes. This could mean, for example, that if data have been previously submitted to another Alberta registry, which has equivalent or better verification requirements (e.g.:. annual audit of the data through Third Party Auditor), and where evidence from previous audits can be provided, these data are less likely to be erroneous, and therefore, have a lower risk associated with them. These data will not be the focus of a sampling plan.

Third Party Auditor Communication with the Person Responsible

It is the Third Party Auditor's responsibility to communicate to the Person Responsible which verification procedures are likely to occur during and after the field visit and to provide a tentative schedule. The Person Responsible can help with availability of information and personnel, and to set an appropriate time and location to collect the necessary evidence.

The verification procedures should be designed to provide limited assurance. These procedures should originates from anomalies noted in the preliminary analysis and areas of risk identified through the risk and magnitude assessment. These procedures may change during the project as new evidence is provided and assessed. As a result, the verification and sample plan may be in flux until sufficient and appropriate evidence has

been provided to explain the anomalies and the Third Party Auditor is confident that the areas of risk in the data management system have not created material discrepancies in the compliance report. Once an anomaly has been sufficiently and appropriately explained, and the Third Party Auditor is satisfied that there are no material discrepancies, no further verification procedures are required for the anomaly.

If responsible party is concerned that the verification procedures are not appropriate (i.e., either not sufficient or too rigorous), the Third Party Auditor must be able to justify the verification procedures through connections to the anomaly or area of risk in the data management system and the assessment of the quality of evidence provided.

If there is disagreement on the appropriateness of the verification procedures after the explanation, Alberta Environment may be contacted to assess the verification procedures and the supporting evidence, and make a decision on the appropriateness of these procedures. If required, the Third Party Auditor must amend the verification procedures as instructed by Alberta Environment. The Person Responsible is required to cover the costs associated with the amendments.

Commencement of fieldwork
Fieldwork can start once the preliminary assessment is done and the verification plan has been drafted.

7.4.3 Executing the Verification

Execution of the verification involves applying the procedures developed in the verification plan. Table 6 provides examples of procedures that could be applied in a verification process.

Note: *This table is for illustration purposes only. Each facility should have verification procedure designed for their unique situation.*

Table 6: Example Verification Procedures.

Type	Example
Computation	Compute the emissions to corroborate clients calculations
Observation	Observe the login procedures to corroborate security of the data
Confirmation	Confirm that production was delivered by contacting the consumer
Enquiry	Enquire client personnel as to emissions management
Inspection	• Inspect the site to corroborate GHG inventory (sources and sinks, measured parameters, measurement technology, technology enhancements, etc) • Inspect maintenance records to corroborate measurement accuracy and operation • Inspect calculations to corroborate conformance to verification criteria • Inspect manufacturer's specification to corroborate efficiencies, accuracies and/or limitations • Inspect spreadsheet calculation to corroborate the correct application of the verification criteria (e.g., quantification methodologies) and conversion factors • Inspect lab records to corroborate fuel composition
Analysis	Analysis of history of production and emissions

Note: verification procedures are designed identify the causes of any data anomalies and ensure risks posed by the data management system do not result in material discrepancies. As there are several verification procedures that could be applied to investigate one anomaly or risk, the verifier should use professional judgement to determine when sufficient and appropriate evidence has been collected to explain the anomaly and concerns about data management risks.

Once the appropriate verification procedures have been applied, the collected evidence must be assessed to determine whether the client's GHG assertion is supported by sufficient and appropriate evidence. To do this, the GHG assertion and supporting evidence are compared against the verification criteria. If the auditor determines that the GHG assertion is supported by sufficient and appropriate evidence, and that it adheres to the verification criteria, a statement of verification can be drafted and the working papers completed.

Issues arising during the verification

Problems can be encountered in verifications. It is possible that qualitative and quantitative discrepancies may be identified. The Third Party Auditor needs to form an opinion on whether a discrepancy is material or not. Based on the type of discrepancy, different responses are appropriate:

Immaterial Discrepancies
Where the discrepancy is deemed by the Third Party Auditor to be immaterial, the Third Party Auditor should communicate easily correctable immaterial discrepancies to the Person Responsible so that they can make efforts to correct the discrepancies (e.g., transcription or typographical errors) in the compliance report before submission. Uncorrected immaterial discrepancies must be reported in the Third Party Auditor's Report.

Note: the Third Party Auditor can issue a verification statement with unresolved immaterial discrepancies.

Material Discrepancies
Where the Third Party Auditor deems the discrepancy to be material, the Third Party Auditor must communicate the discrepancy to the Person Responsible. Significant efforts must be made by the Person Responsible to correct any material discrepancies. If material discrepancies cannot be corrected in the time required, the Person Responsible must disclose the material discrepancies in the compliance report, and the Third Party Auditor should proceed to finalize the verification. If the Person Responsible does not disclose this information in the compliance report, the Third Party Auditor cannot issue a statement of verification.

Note: material and unresolved immaterial discrepancies must be identified in the Third Party Auditor's report as these discrepancies may have implications for past reporting.

Note: the Auditor cannot sign off on a facility's compliance report if there are unresolved material discrepancies (discrepancies accounting for greater than 5% of total emissions).

7.4.4 Completing the Verification

Figure 4 outlines the process for completing the verification. This stage of the verification should produce a draft Third Party Auditor's Report, which must be provided to the Person Responsible.

Third Party Auditor's Report
The Third Party Auditor's is a summary and discussion of the facility's verification procedures and results for its compliance report. The report must be sufficiently complete to provide Alberta Environment assurance that the values reported in the application are accurate and correct based on the information available.

The Third Party Auditor should ensure that all emissions sources have been included and reported in the correct source categories; emissions were calculated using appropriate methodologies; production used is consistent with the *Specified Gas Emitters Regulation*; and that facility data management systems, maintenance, etc., are consistent with what was reported in the compliance report.

The Third Party Auditor's report must contain:

- the final verification plan (see section 7.4.2, page 37 for complete list of verification plan requirements);
- a complete schedule of audit procedures;
- names of verification team members;
- a risk assessment;
- findings identifying any material and unresolved immaterial discrepancies.

And should indicate whether a site visit including an examination of the relevant sources and species of greenhouse gases, maintenance and calibration procedures, and production was completed and whether the results were satisfactory.

If discrepancies are identified, the Third Party Auditor must not consult or play a role in managing the data management system, or provide advice on solutions or their implementation. These decisions must be left to the Person Responsible.

For completeness, the Third Party Auditor must ensure that all required information is included. Table 7 contains a template for the Third Auditor's report that meets the requirements identified in this section.

Table 7: Third Party Auditor's Report Template

Section	Content
1. Verification Report	Summary table containing: • Facility identification information • Facility contact information • Verification objective • Verification summary • Audit team members • Report and audit dates
2. Introduction	Provide an introduction to the facility and the verification. This should include the facility's baseline emissions intensity and its net emissions intensity target.
3. Objective	Discuss the objective of the verification
4. Scope	Discuss the scope of the objective
5. Verification Criteria	List the verification criteria used and any relevant, supporting documentation used
6. Final Verification Plan	Provide a detailed discussion of the final verification plan including: • Methodologies • Key emissions sources • Final sampling plan • Other relevant information
7. Audit Schedule	Provide a list of verification activities and dates

8. Verification Procedures	Identify steps taken during the verification including: • Methodologies used to assess/verify emissions data • Details of site visit • Other relevant information
9. Verification Findings	Discuss findings and results: • Material and unresolved immaterial discrepancies • Data management system and controls • Emissions sources • Process flow diagram for the facility • Facility boundary compared with the facility definition under the *Regulation* • Statement of findings
10. Statement of Verification	This must be the Statement of Verification (SoV) from the compliance report form
11. Verification Team	Clearly identify all team members and their respective duties
12. Appendix	Any relevant documentation such as methodologies, and calculations that provide clarity and assist Alberta Environment in assessing the completeness of the review.

The working papers are the backbone of the verification process. They must be retained and made available to Alberta Environment upon request. This documentation should be reviewed by an authority within the auditor's organization to confirm the quality and conclusions from the verification.

Verification working papers typically consist of:

- The signed contract,
- A listing of the practitioners involved in the verification,
- A risk assessment for the engagement,
- The results of the materiality assessment,
- The results of the preliminary data analysis,
- The verification plan,
- Documentation of data management system and controls,
- Results of verification procedures,
- The team's conclusions, and
- The Statement of Verification.

Closing meeting

Once the draft Auditor's Report has been compiled, the Third Party Auditor must provide the draft report to the Person Responsible. A meeting should be arranged to discuss the report and provide an opportunity for the Person Responsible to clarify any outstanding issues. The Person Responsible and Third Party Auditor should attempt to resolve outstanding issues at the closing meeting.

The Third Party Auditor and Person Responsible should establish a timeline for the provision of additional information required or relating to the correction of immaterial discrepancies. If the event that material discrepancies cannot be resolved within the timeframe available, the Third Party Auditor must include the discrepancies in the Third Party Auditor's report. The Person Responsible must submit the Third Party Auditor's report to Alberta Environment with the facility's compliance report.

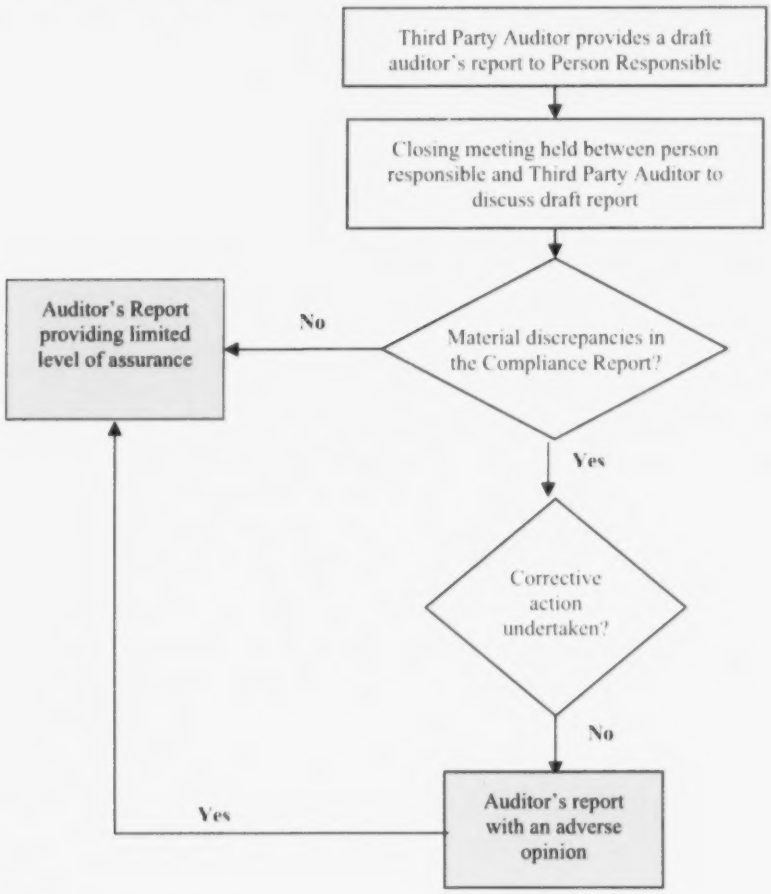
Third Party Auditor provides a draft auditor's report to Person Responsible
Closing meeting held between person responsible and Third Party Auditor to discuss draft report
Material discrepancies in the Compliance Report?
No
Auditor's Report providing limited level of assurance
Yes
Corrective action undertaken?
No
Yes
Auditor's report with an adverse opinion

Figure 4: Process to Complete the Verification.

7.5 Statement of Verification

For a limited level of assurance, there are three possible verification statements that can result from the verification process (see Figure 5):

- a limited level assurance statement
- a qualified limited level assurance statement
- an adverse assurance statement

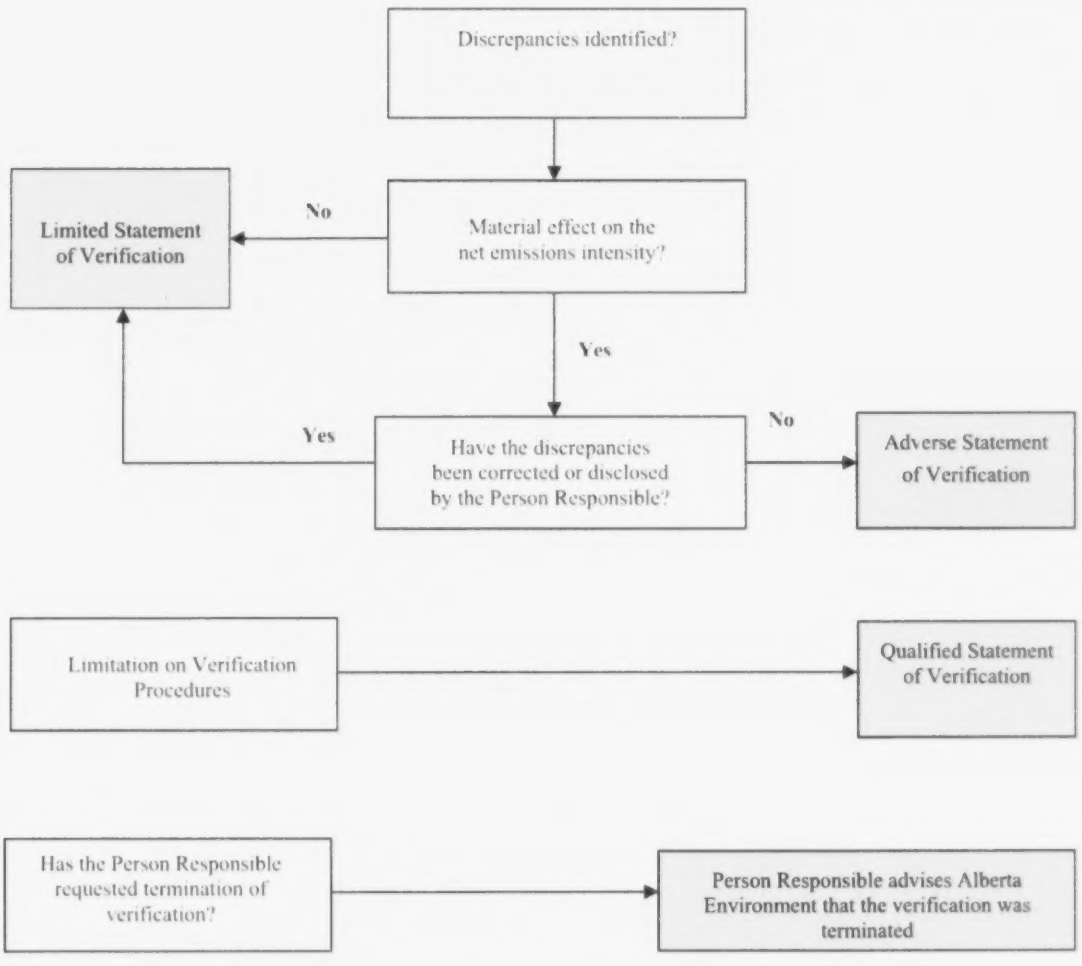
Discrepancies identified?
Material effect on the net emissions intensity?
No
Limited Statement of Verification
Yes
Have the discrepancies been corrected or disclosed by the Person Responsible?
Yes
No
Adverse Statement of Verification
Limitation on Verification Procedures
Qualified Statement of Verification
Has the Person Responsible requested termination of verification?
Person Responsible advises Alberta Environment that the verification was terminated

Figure 5: Possible Verification Outcomes.

Limited Level of Assurance - Statement of Verification
This statement of verification is issued by the Third Party Auditor to the Person Responsible if the Third Party Auditor is satisfied that they have undertaken sufficient procedures and there has been sufficient and appropriate evidence supplied to determine that nothing has come to their attention that causes them to believe that the baseline emissions intensity is not fairly stated. This report may be issued despite immaterial discrepancies remaining.

Qualified Limited Level of Assurance - Statement of Verification
A qualified statement of verification is appropriate if the Third Party Auditor is unable to form an opinion on certain aspects of the compliance report due to circumstances beyond the control of the Third Party Auditor and the Person Responsible. Examples include the disposal of records in compliance with regulations or the destruction of records in a natural disaster. Limitations on the scope of the assurance should be clear in the statement of verification and the reasons for the limitation should be disclosed in the Third Party Auditor's report. The reasons for the limitations should be clearly stated such that Alberta Environment has adequate information to decide on an appropriate course of action. Further guidance is provided in ISO 14064: Part 3, Annex A.2.9.2.

Adverse Assurance – Statement of Verification
Adverse assurance statements are rarely issued, but when they are, it is because there are outstanding, unresolved, and undisclosed material discrepancies.

Verification terminated at the request of the Person Responsible and no Auditor Report or Statement of Verification issued
If faced with an adverse Auditor's report, the Person Responsible may consider asking the Third Party Auditor not to produce the report and terminate the verification. This may be for a number of reasons including the Person Responsible requiring more time to prepare for the verification. The Person Responsible must inform Alberta Environment upon termination of the verification.

Content of the Statement of Verification
A measure of uniformity in the form and content of the Statement of Verification is important because this helps to promote the reader's understanding and to identify unusual circumstances when they occur.

The Statement of Verification must include the following elements:

- identify to whom the report is directed;
- describe the objective, subject matter and time period covered by the verification;
- identify the GHG assertion;
- describe the responsibilities of management and the auditor;

- identify the applicable standards in accordance with which the verification was conducted;
- identify the criteria against which the GHG assertion and supporting evidence was evaluated;
- state a conclusion that conveys the level of assurance being provided and/or any reservation the auditor may have;
- state the date of the report;
- identify the name of the auditor (or firm); and
- identify the place of issue.

Below is an example of a Statement of Verification:

To Alberta Environment,

Scope
We have reviewed the Net Emissions Intensity presented in Facility A's 2007 Specified Gas Compliance Report for the period July 1, 2007 to December 31, 2007. Facility A's management is responsible for the collection and presentation of the information within the Report. Our responsibility is to express a conclusion as to whether anything has come to our attention to suggest that the Net Emissions Intensity is not presented fairly in accordance with Alberta Environment's *Specified Gas Emitters Regulation* and associated guidance documents.

Methodology
Our verification was completed in accordance with the International Standard on Assurance Engagements (ISAE) 3000, developed by the International Federation of Accountants. As such, we planned and performed our work in order to provide limited, rather than absolute assurance with respect to the GHG emission intensity information we reviewed. Our verification criteria were based on guidelines approved by Alberta Environment. We believe our work provides a reasonable basis for our conclusion.

GHG Assertion
Facility A has an approved Baseline Emissions Intensity of X tonnes of CO_{2e} per unit production and a Net Emissions Intensity Limit of Y tonnes of CO_{2e} per unit production. Facility A asserts that their Net Emissions Intensity for the 2007 compliance reporting period is Z tonnes of CO_{2e} per unit of production.

Facility A has purchased (X Fund Credits, Y Offset Credits, and/or Z EPCs) to achieve a Net Emissions Intensity of P tonnes of CO2e per unit production for the 2007 compliance reporting period.

Conclusion
Based on our work, nothing has come to our attention that causes us to believe that the Net Emission Intensity of Z tonnes of CO_{2e} per year stated in the Compliance Report is not presented fairly in accordance with the relevant criteria.

Signature
Auditor
City, Province, Country
Date

The Conclusion paragraph states the opinion of the Third Party Auditor and can change if a qualified or adverse opinion must be rendered.

An example of a qualified opinion is:
Based on our work, there was not sufficient and appropriate evidence to support a conclusion on the Net Emissions Intensity during the period xx,xx to xx,xx. As referenced in the Compliance Report, records for this period were unavailable. Readers are cautioned that statements during this period may not be appropriate for their purposes. Based on our work during the period zz,zz to zz,zz, nothing has come to our attention that causes us to believe that the Net Emission Intensity presented in the Report for this period is not presented fairly in accordance with the relevant criteria.

An example of an adverse opinion is:
Based on our work, the Compliance Report does not contain all the disclosures required by Alberta Environment. Readers are cautioned that these statements may not be appropriate for their purposes.

7.6 Subsequent Events

In certain circumstances, matters may come to the attention of the Third Party Auditor that renders a previously issued Auditor's Report invalid or inaccurate. Third Party Auditors are not required to actively monitor the validity of their reports after issuance. However, where it is brought to the attention of the Third Party Auditor, they must notify the Person Responsible.

When such circumstances arise, the Person Responsible must notify Alberta Environment.

8.0 Completing the Compliance Report

The 2007 Specified Gas Compliance Report forms are available in Microsoft Excel format on the Alberta Environment Greenhouse Gas Reporting website at:

http://www.environment.alberta.ca/631.html

The Compliance Report form contains seven sections (A-G), two instructions pages and five forms that must be printed and signed. Fill out all sections of the Application as applicable. Enter or check "not applicable" (N/A) for items that do not apply to your facility.

The sections to be completed are:

Section A: Administrative Information
Section B: Emissions, Production and Intensity Information
Section C: Calculation Methods
Section D: Cogeneration Information
Section E: Compliance
Section F: Additional Comments
Section G: Third Party Auditor Information
Submission of Information
Conflict-of-Interest Checklist
Statement of Qualification
Statement of Verification
Statement of Certification
2007 Emission Performance Credit Request Form

Note: *The 2007 Emission Performance Credit Request Form should only be submitted if the facility is entitled to Emission Performance Credits.*

8.1 Instructions

This section provides assistance with filling out the Compliance Report form including contact information for questions relating to the Compliance Report form.

8.2 Section A: Administrative Information

Note: Most of the information in this section can be found on the Baseline Emissions Intensity Application. Where applicable, copy the information into the Compliance Report and update as required.

Worksheet A1
Section A: Administrative Information

Facility ID Number
Enter the facility ID number that is used by the facility in the one-window electronic data reporting system (EDR) for reporting of greenhouse gas emissions. This is a six digit alphanumeric ID. If the facility did not submit using the EDR for 2004, 2005 or 2006 reporting, then it will not have a facility ID and N/A can then be entered in this field.

Facility Name
Enter the facility name used on the Baseline Emissions Intensity Application.

EPEA Approval/Registration Number(s)
Enter all active EPEA approval or registration numbers that apply to this facility. If the facility does not have an EPEA approval or registration, enter N/A.

EUB License/Registration Number(s)
Enter all active EUB license or registration numbers that apply to this facility. If the facility does not have an EUB license or registration, enter N/A.

NPRI ID(s)
Enter all NPRI ID numbers that apply to the facility. If the facility does not have an NPRI ID, enter N/A.

NAICS Code
Enter the six-digit North American Industry Classification System (NAICS) number that applies to the facility. Facilities must only enter one NAICS code. Some complex facilities, such as the oil sands facilities, may not precisely fit into one NAICS category. The most appropriate NAICS code for the majority of the activities at the facility should be chosen.

Facility Geographical Coordinates
Enter the geographical coordinates (latitude and longitude in NAD 83) of the facility. Use the centre point of the facility if the facility cannot be identified with one exact point location. Pipeline facilities may pick one point or piece of equipment along the contiguous section of the pipeline operation (such as a compressor station) and use its geographical coordinates.

Facility Legal Land Description
Enter the facility's legal land description. Pipeline facilities may enter N/A for their legal land description.

Facility Location
Enter the physical location of the facility.

Facility City/District/Municipality/County
Enter the city/district/municipality/county of the facility; whichever is most appropriate for the facility's location.

Province/Territory
Enter the province/territory of the facility. This should always be Alberta.

Postal Code
Enter the postal code of the facility.

Facility Mailing Address
Enter the facility mailing address; the address may differ from the facility's location.

Mailing Address City/District/Municipality/County
Enter the city/district/municipality/county, whichever is most appropriate for the mailing address of the facility,

Province/Territory
Enter the province/territory of the mailing address of the facility.

Postal Code
Enter the postal code of the mailing address of the facility.

First Year of Commercial Operation
Enter the first year of commercial operation of the facility, as reported in the Baseline Emissions Intensity Application for this facility.

Number of Years of Continual Operation
Enter the number of years of continual operation of the facility. If the facility has been shutdown for an entire year, then the number of years of continual operation would start after that shutdown year.

2007 Year of Commercial Operation
Enter the year of commercial operation for the facility that concluded on December 31, 2007. This will carry forward to section E of the Compliance Report and will be used to calculate the facility's Net Emissions Intensity Limit.

Worksheet A2
Section A: Administrative Information (continued)

Reporter
Enter the first and last name; position/title at the company or facility; telephone and fax numbers; email address; mailing address; city, district, municipality or county (whichever is most applicable); province/territory and postal code of the Reporter (contact at the facility for the 2007 Specified Gas Compliance Report).

Reporting Company
Enter the reporting company's legal and trade names, and the reporting company's business number. The legal and trade names may not be the same. The business number is a nine-digit common identification number provided by the Government of Canada. It is usually found on a company's GST form.

Enter the reporting company's mailing address, city or district or municipality or county (whichever is most applicable), province/territory and postal code.

Worksheet A3
Section A: Administrative Information (continued)

Describe any changes to the facility's boundaries, operations and major sources of greenhouse gas emissions from what was reported in the Baseline Emissions Intensity Application. Also, describe any impact these changes had on the greenhouse gas emissions, production and intensity of the facility. This could include general information about any changes to the: boundaries, operations or activities included at the facility. It could also include changes to what is excluded at the facility and any other relevant boundary or operational change information.

If additional space is required, attach an additional document with the submitted Compliance Report, indicating which section of the Compliance Report the additional information belongs to.

Worksheet A4
Section A: Administrative Information (continued)

Consultant Information
Enter the contact information for the consultant hired to complete the report or to calculate emissions, production or other information used to complete this report (excluding auditing). Enter the first and last name, professional designation, position/title at the consulting company, telephone and fax numbers, email address, mailing address, city, district, municipality or county (whichever is most applicable), province/territory and postal code.

If a consultant was not hired to complete or work on the 2007 Specified Gas Compliance Report, enter an "X".

Worksheet A5
Section A: Administrative Information (continued)

Public Contact
Enter the first and last name; position/title at the company or facility; telephone and fax numbers; email address; mailing address; city, district or municipality (whichever is most applicable); province/territory and postal code for the public contact. If the public

contact is the same as the Reporter, enter an "X" in the Same as Reporter box. You are not required to re-enter the information.

Certifying Official
Enter the first and last name; position/title at the company or facility; telephone and fax numbers; email address; mailing address; city, district or municipality (whichever is most applicable); province/territory and postal code of the Certifying Official. This information will carry forward to the Statement of Certification and Emission Performance Credit Request Form.

Worksheets A6 and A7
Section A: Administrative Information (continued)

Parent Company Information
Enter an "X" next to each parent company before filling in the required information. Enter the legal name; percent ownership of the facility; mailing address; city, district, municipality or country (whichever is most appropriate); province/territory; postal code; Business number (provided by the Government of Canada and available on the companies GST form), and Data Universal Numbering System (DUNS) number (if applicable) of each Canadian parent company that owned 10% or more of the facility on December 31, 2007.

Note: the DUNS number is a nine digit tracking number used by businesses and government to track businesses worldwide. A Company's DUNS number can be obtained by contacting the company's financial department.

If you do not have any additional parent companies, leave the boxes blank.

8.3 Section B: Emissions, Production and Intensity Information

Emissions for the six specified gases (CO_2, CH_4, N_2O, HFC, PFC and SF_6) subject to the *Regulation* by source category or species are reported in this section. This information is then used to calculate the full-year 2006, full-year 2007 and July 1 – December 31, 2007 emissions intensities for the facility.

Production information must also be reported. The Total Half Year Emissions (July 1 – December 31, 2007) and Total Half Year Production information will be used to calculate the Net Emissions Intensity for the facility. The information entered in this section will carry forward throughout the rest of the application.

If the specified emissions from the specified source do not occur at the facility, enter an "X" in the appropriate N/A box.

Note: *Facilities whose baseline year was 2006 DO NOT need to complete the Full-Year 2006 section.*

Worksheets B
Section B: Emissions, Production and Intensity Information

The 2007 Specified Gas Compliance Report requires facilities to submit third party verified full-year 2006, full-year 2007and half year 2007 (July 1 - December 31, 2007) greenhouse gas emissions and production information. Given possible time and resource constraints facilities may face while completing or verifying the 2007 Specified Gas Compliance Report, facilities may choose to defer submitting the third party verified full-year 2006 and full-year 2007 greenhouse gas emissions and production information until March 2009. These facilities will then be required to submit it as part of their 2008 Specified Gas Compliance Report, due March 31, 2009.

Enter an "X" in the appropriate box to indicate when you will be submitting the third party verified full-year 2006 and full-year 2007 greenhouse gas emissions and production information.

Note: *Facilities completing section D (cogen) of the Compliance Report may also defer submitting third party verified full-year 2006 and full-year 2007 cogeneration information.*

Worksheets B1, B1(2) and B1(3)
Section B: Emissions, Production and Intensity Information

Stationary Fuel Combustion Emissions
Enter CO_2, CH_4 and N_2O emissions in tonnes from stationary fuel combustion sources.

Note: *Combustion of Biomass: CO_2 emissions from the combustion of biomass must be reported in a separate source category (CO_2 Emissions from the Combustion of Biomass), and are included in the calculation of Total Direct Emissions for the facility. However, CO_2 emissions from the combustion of biomass are not included in the calculation of Total Half Year Emissions (THYE) for the facility. N_2O and CH_4 emissions from biomass combustion must be reported in the Stationary Fuel Combustion source category and are included in Total Half Year Emissions (THYE).*

Industrial Process Emissions
Enter CO_2, CH_4 and N_2O emissions in tonnes from industrial process sources. Total industrial process emissions in CO_2e are automatically calculated.

Note: *Industrial process emissions are included in the calculation of Total Direct Emissions for the facility. However, industrial process emissions are not included in the calculation of Total Half Year Emissions (THYE) for the facility.*

Venting Emissions
Enter CO_2, CH_4 and N_2O emissions in tonnes from venting sources.

Flaring Emissions
Enter CO_2, CH_4 and N_2O emissions in tonnes from flaring sources.

Other Fugitive Emissions
Enter CO_2, CH_4 and N_2O emissions in tonnes from other fugitive sources.

On-site Transportation Emissions
Enter CO_2, CH_4 and N_2O emissions in tonnes from on-site transportation sources.

Waste and Wastewater Emissions
Enter CO_2, CH_4 and N_2O emissions in tonnes from waste and wastewater sources

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Note: *CO_2 Emissions from the aerobic decomposition of waste are included in the calculation of Total Direct Emissions, but are not included in the calculation of Total Half Year Emissions for the facility. CH_4 and N_2O emissions from the aerobic decomposition of waste are included in the Waste and Wastewater source category.*

Vented Raw Gas Emissions
Enter CO_2 emissions in tonnes from vented raw gas sources.

Worksheets B2, B2(2) and B2(3)
Section B: Emissions, Production and Intensity Information (continued)

Hydrofluorocarbon (HFC) Emissions
Enter hydrofluorocarbon emissions (in tonnes) from industrial product use sources for each of the specified HFC species. Total HFC from industrial product use in CO_2e is automatically calculated.

Enter hydrofluorocarbon emissions (in tonnes) from industrial process sources for each of the specified HFC species. Total HFC from industrial process in CO_2e is automatically calculated.

Worksheets B3, B3(2) and B3(3)
Section B: Emissions, Production and Intensity Information (continued)

Perfluorocarbon (PFC) Emissions
Enter perfluorocarbon emissions (in tonnes) from industrial product use sources for each of the specified PFC species. Total PFC from industrial product use in CO_2e is automatically calculated.

Enter perfluorocarbon emissions (in tonnes) from industrial process sources for each of the specified PFC species. Total PFC from industrial process in CO_2e is automatically calculated.

Sulphur Hexafluoride (SF_6) Emissions
Sulphur hexafluoride is reported separately for industrial product use sources and industrial process sources. Both are reported in tonnes.

Total HFC, PFC and SF_6 Emissions
Total HFC, PFC and SF_6 emissions in tonnes CO_2e from industrial product use and industrial process are brought forward using previously entered data. Total HFC, PFC and SF_6 emissions in tonnes CO_2e are automatically calculated.

Worksheets B4, B4(2) and B4(3)
Section B: Emissions, Production and Intensity Information (continued)

CO_2 Emissions from the Combustion of Biomass
Enter CO_2 emissions in tonnes arising from the combustion of biomass materials.

Note: *CO_2 emissions from the combustion of biomass must be included in the calculation of Total Direct Emissions, but are not included in the calculation of Total Half Year Emissions (THYE) for the facility. The formula used to calculate THYE automatically excludes CO_2 emissions from the combustion of biomass.*

CO_2 Emissions from Aerobic Decomposition of Waste
Enter CO_2 emissions in tonnes arising from the aerobic decomposition of biomass waste materials in tonnes.

Note: *CO_2 emissions from aerobic decomposition of waste must be reported and included in the calculation of Total Direct Emissions, but is not included in the calculation of Total Half Year Emissions (THYE) for the facility. The formula used to calculate THYE automatically excludes CO_2 emissions aerobic decomposition of waste.*

Worksheets B5, B5(2) and B5(3)
Section B: Emissions, Production and Intensity Information (continued)

Total CO_2, CH_4 and N_2O Emissions
The total CO_2, CH_4 and N_2O emissions are all automatically calculated using values already entered in the Compliance Report.

Total Annual Emissions Calculation
The Total Direct Emissions, GHG emissions from industrial process and Total Annual Emissions / Total Half Year Emissions fields are automatically calculated using values already entered in the Compliance Report.

Public availability of GHG emissions information
Using the checkboxes, indicate whether or not greenhouse gas emissions data (gas total or source level) is publicly available for the appropriate year.

Worksheets B6, B6(2) and B6(3)
Section B: Emissions, Production and Intensity Information (continued)

Note: *These worksheets do not apply to facilities using the 2007 Specified Gas Compliance Report for Stand-alone Cogeneration Facilities.*

Production Information
Enter the product name, quantity, and SI units for each product at the facility that is included in determining the total production (P) for the year/half year. Production is the quantity, expressed in the applicable unit, of production of end product produced by a facility. **End product must be a product(s) that is sold in the marketplace and cannot be an intermediate item leading to an end product.** Facilities that have an end product must use an end product for their total production.

Facilities that do not have an end product (e.g. landfills) may use any input, output or other thing specified under subsection (4) of the *Specified Gas Emitters Regulation*, as approved by the Director. Enter the total production (P) value and units calculated for the year/half-year (combine all applicable production items in an appropriate manner).

List what is included in total production (P). Facilities that produce multiple products must explain (include formulas) how total production was calculated.
Enter the required information.

Public Availability of Production Information
Using the checkbox, indicate whether production information is publicly available for the year.

Worksheets B7, B7(2) and B7(3)
Section B: Emissions, Production and Intensity Information (continued)

Note: *These worksheets do not apply to facilities using the 2007 Specified Gas Compliance Report for Stand-alone Cogeneration Facilities.*

Emissions Intensity
Total annual (or half year) emissions and total annual (or half year) production are used to automatically calculate emissions intensity. Enter the appropriate units for the emissions intensity value.

8.4 *Section C: Calculation Methods*

This section of the Compliance Report requires:

- Listing of the general category of calculation methodology used for CO_2, CH_4 and N_2O by source category;
- Listing of the calculation methodology reference used for CO_2, CH_4 and N_2O by source category;
- The description of greenhouse gas emissions estimation and calculation methods and reference materials used in calculating the facility's greenhouse gas emissions;
- The reporting of any change in emissions calculation methods between the baseline and compliance years, including the reason why the any calculation methods were modified; and
- The description of how half-year emissions and half-year production values were calculated.

Worksheet C1
Section C: Calculation Methods

Method Type
List all the method categories that were used to calculate emissions of each gas by source category.

Enter 1 for monitoring/direct measurement; 2 for intermittent (periodic) direct measurement; 3 for calculated based on measured surrogate parameters; 4 for extrapolated from historical data; 5 for estimated from design requirements; 6 for estimated from agreements; 7 for mole balance with efficiency factors; 8 for equipment-specific emission factors; 9 for manufacturer's emission factors; 10 for models based on surrogate parameters; 11 for generic emission factors; and 12 for top-down emission factors.

Worksheet C2
Section C: Calculation Methods (continued)

Citation of Method References
List all the method references that were used to calculate emissions of each gas by source category.

Worksheets C3, C4, C5 and C6
Section C: Calculation Methods (continued)

Provide details on the method(s) used including the rationale for the selection of the specific methods for determining the facility's direct greenhouse gas emissions. This information should include emission estimation/calculation methodologies, emission factors, equations, calculations and citation of reference materials. **Calculation methods and reference materials used for the Compliance Report must be consistent with what was used in the Baseline Emissions Intensity Application for the facility.**

If more space is required, please attach a separate document and reference the applicable section of the r 2007 Specified Gas Compliance Report.

If there are any differences in the methods or information used between the baseline years and the full-year 2006, full-year 2007 and July 1 – December 31, 2007 calculations, these must be stated along with the reasons for using different methods. Additional space is provided in the next worksheet. If more space is required, or if this information is contained in another document, submit the additional information with the Compliance Report. Fuel factors and fuel analysis for integrated cogeneration may be reported in section D of the Compliance Report.

Worksheets C7 and C8
Section C: Calculation Methods (continued)

Provide details on how the half-year emissions and half-year production for the facility were calculated. This information should include the time period of data used (based on daily, monthly, annual numbers, etc), any relevant equations, any assumptions made, and citations for any reference materials used. Additional space is provided in the next worksheet. If more space is required, or if this information is contained in another document, submit the additional information with this Compliance Report.

Worksheets C7, C8, C9 and C10
Section C: Calculation Methods (continued)

If the emissions reported in this Compliance Report differ from the 2006 or 2007 emissions reported previously under the *Specified Gas Reporting Program*, indicate in the space below why and where these differences occur. Also indicate the impact this difference has had on the reported values (i.e. emissions increased or decreased by X tonnes, etc).

Emissions Data reported under the *Specified Gas Compliance Report* will be reviewed, and the data collected will be updated in the *Specified Gas Reporting Program*.

Additional space is available in the next worksheet. If more space is required, submit the additional information along with this Compliance Report. Facilities restating emissions

data should contact Environment Canada to determine whether they need to restate their emissions under the *National Mandatory Greenhouse Gas Reporting Program*.

8.5 Section D: Cogeneration Information

This section of the Compliance Report permits stand-alone cogeneration facilities or facilities with integrated cogeneration to enter information on their cogeneration operation.

Note: *Facilities that did not calculate deemed emissions from cogeneration in their Baseline Emissions Intensity Applications must not complete this section.*

Note: *Facilities whose baseline year was 2006 DO NOT need to complete the Full-Year 2006 cogeneration section.*

Worksheets D1, D1(2) and D1(3)
Section D: Cogeneration Information

Cogeneration Information
Indicate using the N/A checkbox whether there was an integrated cogeneration unit operational during full-year 2006, full-year 2007 or July 1 – December 31, 2007. If no integrated cogeneration unit was present, or you did not use deemed greenhouse gas emissions for your cogeneration unit in the Baseline Emissions Intensity Application, enter an "X". You are not required to enter anything else in this worksheet or in worksheet D2.

For facilities using the 2007 Specified Gas Compliance Report for Stand-Alone Cogeneration facilities, follow the reporting steps outlined below.

GHG Emissions (Cogen)
Enter the *total greenhouse gas emissions* in tonnes CO_2e from the cogeneration unit.

Fuel Use Information
Enter the *type*, *quantity*, *units* and *percent mixture* of the fuels used by the cogeneration unit.

Electricity
Enter the *total electricity generation* (E) in MWh. *Deemed greenhouse gas emissions from electricity generation* (D_E) in tonnes CO_2e is automatically calculated.

Heat
Enter the *total heat production from cogeneration* (H) in GJ. *Deemed input energy attributed to heat* (E_H) in GJ is automatically calculated. Enter the *mass/volume of fuel*

deemed used to produce heat (M_H) in the appropriate units. GHG emissions from heat production (G_H) are automatically calculated.

Worksheets D2, D2(2) and D2(3)
Section D: Cogeneration Information (continued)

If fuel factors were used to calculate greenhouse gas emissions from cogeneration, provide the factors used with references.
Enter the required information. If fuel factors were not used, enter "not applicable".

If fuel analysis was used to calculate greenhouse gas emissions from cogeneration, provide a synopsis of the fuel analysis.
Enter the required information. If fuel analysis was not used, enter "not applicable".

8.6 *Section E: Compliance*

In this section of the 2007 Specified Gas Compliance Report, the Person Responsible determines if the facility has met its emissions intensity limit, and if not, how many Fund Credits, Offset Credits or Emission Performance Credits are required to bring it into compliance with its limit.

Worksheet E1
Section E1: Compliance

Enter the Baseline Emissions Intensity for this facility, as established by the Director. This can be found in the letter sent to the facility that established the facility's Baseline Emissions Intensity. The Net Emission Intensity Limit and whether the facility has met this limit are calculated automatically using information from sections A, B and D.

Note: *If the 2007 Net Emissions Intensity Limit was not met or exceeded, complete worksheets E2-E5 to demonstrate how the facility has trued-up to meet its target.*

Worksheet E2
Section E2: Compliance (continued)

This section of the Compliance Report permits facilities that did not meet their Net Emissions Intensity Limit to use Fund Credits to achieve compliance. Facilities that met or exceeded their target, or that do not plan to use Fund Credits to achieve compliance should enter "X" in the N/A box.

Fund Credits Purchased
Enter the number of Fund Credits purchased or that will be purchased from the Climate Change and Emissions Management Fund.

Cost of Fund Credits
The cost of the Fund Credits will be automatically calculated. No input is required in this field. Be sure to double check the number of Fund Credits you wish to purchase and the cost of these Fund Credits before submitting payment.

Payment for Fund Credits must be submitted by March 31, 2008 to:

Alberta Environment
Financial Services Branch
6th floor, South Petroleum Plaza
9915 - 108 Street
Edmonton, Alberta
T5K 2G8

Note: *Make cheque payable to "Minister of Finance" and be sure to include a copy of worksheet E2 when submitting your payment to the Financial Services Branch.*

Date of Purchase
Enter the date of purchase of the Fund Credits. This will be the date the payment was submitted to the Minister of Finance. It must be on or before March 31, 2008.

Fund Credit Receipt Number
Enter the purchase transaction number. This can be found on the stamp on the Fund Credit Purchase Receipt provided by the Financial Services Branch. Be sure to include a copy of your Fund Credit Purchase Receipt when submitting the 2007 Specified Gas Compliance Report.

The company that owns the facility for which this report is being submitted owns these Fund Credits.
Indicate true or false by entering an "X" in the appropriate field. Fund Credits must be owned by the "Person Responsible" in order to be applied for compliance for this facility.

These Fund Credits have not been used by any other facility within your company
Indicate true or false by entering an "X" in the appropriate field. Fund Credits can only be used once.

Some of the Fund Credits from the above transaction were applied to other facilities within this company.
Indicate true or false by entering an "X" in the appropriate field. Fund Credits may not be used by more than one party.

If part of the Fund Credits acquired in the above transaction were applied to other facilities, list these facilities (facility name and facility ID number).

Fund Credits can be purchased by a company and applied to several of their facilities. If a portion of the Fund Credits in the transaction were applied to other facilities, list the facility name, facility ID number, and number of credits for each of the other facility.

Worksheet E3
Section E3: Compliance (continued)

This section of the Compliance Report permits facilities that did not meet their Net Emissions Intensity Limits to use Offset Credits to achieve compliance. Facilities that met or exceeded their target, or that do not plan to use Offset Credits to achieve compliance should enter "X" in the N/A box.

Offset Credits Purchased
Enter the number of Offset Credits purchased or that will be purchased from offset projects.

List all Offset Credit serial numbers (or range of numbers) that were retired for true-up for this facility. Also list the registry source.
Enter the Offset Credit serial numbers used by this facility. Also note the registry source. The facility must contact the Alberta Offset Registry (or equivalent registry) to have these Offset Credits retired prior to the submission of their Compliance Report.

The reductions used to generate the Offset Credits took place in Alberta.
Indicate true or false by entering an "X" in the appropriate field. The specified gas reduction must occur in Alberta.

The reductions occurred from action taken that was not otherwise required by law at the time the action was initiated.
Indicate true or false by entering an "X" in the appropriate field. The specified gas reduction must occur from action taken that is not otherwise required by law at the time the action was initiated.

The reductions used to generate the Offset Credits occurred after January 1, 2002.
Indicate true or false by entering an "X" in the appropriate field. Offset Credits must result from actions taken on or after January 1, 2002, and occur on or after January 1, 2002.

The reductions are real, demonstrable, quantifiable and measurable (either directly or by accurate estimation using replicable techniques).
Indicate true or false by entering an "X" in the appropriate field. Reductions in specified gas emissions must be real, demonstrable, quantifiable and measurable (either directly or by accurate estimation using replicable techniques).

The company that owns the facility for which this report is being submitted owns these Offset Credits.
Indicate true or false by entering an "X" in the appropriate field. Offset Credits must be held by the Person Responsible using it.

These Offset Credits have not been used by any other facility within this company.
Indicate true or false by entering an "X" in the appropriate field. Offset Credits may only be used once.

The offset project(s) followed an approved Alberta Environment offset protocol and has been verified by a Third Party Auditor.
Indicate true or false by entering an "X" in the appropriate field. An emission offset project must be done according to an approved Alberta Environment offset protocol and must be verified by a third party auditor.

The Offset Credits were verified by a Third Party Auditor.
Indicate true or false by entering an "X" in the appropriate field. Any Offset Credits generated from an offset project must be verified by a Third Party Auditor.

An external company or organization owns part of these Offset Credits.
Indicate true or false by entering an "X" in the appropriate field. Offset Credits must be held by the Person Responsible using it. If an Offset Credit is jointly held, each holder may only use a portion of the Offset Credit on a pro rata basis.

If so, in the field below please list the company(s) and the appropriate contact information for them.
If an emission offset is jointly held, please list the other company names and contact information for each.

Worksheet E4
Section E4: Compliance (continued)

This section of Compliance Report permits facilities that did not meet their Net Emissions Intensity Limits to use Emission Performance Credits to achieve compliance. Facilities that met or exceeded their target, or that do not plan to use Emission Performance Credits to achieve compliance should enter "X" in the N/A box.

Emission Performance Credits Purchased
Enter the number of Emission Performance Credits being used for compliance.

List the range of serial numbers and original owner (company that generated) of these Emission Performance Credits.
Enter the Emission Performance Credit serial numbers and original owner (credit generator) used by this facility.

Note: *If the Emission Performance Credits were purchased from an external company, please submit a copy of the Emission Performance Credit Purchase Receipt and any other relevant ownership documents with the Compliance Report.*

My company owns all of the above Emission Performance Credits being used for the compliance of this facility.
Indicate true or false by entering an "X" in the appropriate field. An Emission Performance Credit must be held by the Person Responsible using it.

None of these credits have been used for compliance by any other facility within your company.
Indicate true or false by entering an "Xx" in the appropriate field. An Emission Performance Credit may only be used once.

None of these credits have been used for compliance by any other facility.
Indicate true or false by entering an "X" in the appropriate field. An Emission Performance Credit may only be used once.

An external company or organization jointly owns some of the above credits.
Indicate true or false by entering an "X" in the appropriate field. An Emission Performance Credits must be held by the Person Responsible using it. If an Emission Performance Credit is jointly held, each holder may only use a portion of the Emission Performance Credit on a pro rata basis.

If so, in the field below please list the company(s) and the appropriate contact information for them.
If an Emission Performance Credit is jointly held, please list the other company names and contact information for each.

Worksheet E5
Section 5: Compliance (continued)
This section of the Compliance Report determines if the facility is in compliance with its Net Emissions Intensity Limit after using Fund Credits, Offset Credits and Emission Performance Credits. This worksheet also calculates any Emission Performance Credits generated. No input is required for this worksheet. If the "Intensity Limit Met" field does not show "Yes", then the facility will require additional credits to reach compliance with its Net Emissions Intensity Limit.

8.7 Section F: Additional Comments

This section of the Compliance Report permits the entering of additional information and asks the Person Responsible to provide the facility or company's website.

Worksheet F
Section F: Additional Comments

Facility or Company Website
Enter the website of the facility or reporting company.

Comments
Enter any additional comments or information that is relevant to the 2007 Specified Gas Compliance Report.

Note: Power plant facilities are required to report gross electricity generation in the additional comment field.

8.8 *Section G: Third Party Auditor Information*

Enter the contact information for the Third Party Auditor, including a statement explaining how the Auditor satisfies the qualification requirements as stipulated by Alberta Environment. The information entered in this section will carry forward to the Conflict-of-Interest Checklist, Statement of Qualification and Statement of Verification.

Worksheet G
Section G: Third Party Auditor Information

Third Party Auditor Information
Enter the first and last name, professional designation, position/title, telephone and fax numbers, email address, country, province/territory/state, mailing address, city/district/municipality/county (whichever is most applicable), and postal code/zip code of the Third Party Auditor.

Auditing Company Information
Enter the auditing company name, phone and fax numbers, country, province/territory/state, mailing address, city/district/municipality/county (whichever is most applicable), postal code/zip code, and company website (if applicable).

Auditor Qualifications
Explain how the auditor satisfies the Qualification requirements for Third Party Auditors.

8.9 *Submission Information*

This section provides instructions on when and where the 2007 Specified Gas Compliance Report and associated documents must be submitted. Check the appropriate box if the facility is requesting confidentiality under the *Specified Gas Emitters Regulation* for some or all of the Compliance Report. Facilities wishing to pursue a

confidentiality request **must submit a written request** with appropriate justification and supporting documentation by mail or courier to the Director by March 31, 2008.

Note: It is an offence under the *Climate Change and Emissions Management Act* to provide false or misleading information. Maximum penalties upon conviction are significant and can include, in the case of knowingly providing false or misleading information, imprisonment: see ss. 44 and 45 of the *Climate Change and Emissions Management Act*.

Worksheet: Submission Information

8.10 Conflict-of-Interest Checklist

This section requires the Third Party Auditor to complete a Conflict-of-Interest Checklist to confirm their independence from the facility or reporting company. Enter an "X" in the appropriate box for each of the statements. If any of the statements are true, the Person Responsible should contact Alberta Environment for further instruction if it is still considering engaging this Third Party Auditor. Please note, if the potential conflict-of-interest is a sufficient perceived or actual threat to impartiality or cannot be effectively managed, the Third Party Audit Report produced by that Third Party Auditor will not be accepted by Alberta Environment. A signed original Conflict-of-Interest Checklist (not a copy) must be submitted to Alberta Environment.

Worksheet: CoI Checklist

8.11 Statement of Qualification

The Statement of Qualification must be printed on letterhead and must be signed and dated by the Third Party Auditor. It states that the auditor meets or exceeds the qualifications of Third Party Auditors as stated in section 18 of the *Regulation*, and this *Technical Guidance Document for 2007 Specified Gas Compliance Reports*. A signed original SoQ (not a copy) must be submitted to Alberta Environment.

Worksheet: SoQ

8.12 Statement of Verification

The Statement of Verification (SoV) requires the Third Party Auditor to:

- Describe the objective of the review and the entity or portion thereof, the subject matter, and the time period covered by the review;
- Identify the GHG assertion;
- Describe the responsibilities of management and the reviewer;

- Identify the applicable standards in accordance with which the review was conducted;
- Identify the criteria against which the GHG assertion and supporting evidence was evaluated;
- State a conclusion that conveys the level of assurance being provided and/or any reservation the Third Party Auditor may have;
- State the date of the report; and
- Identify the name of the reviewer (or firm).

The Statement of Verification must be printed (no letterhead required), signed and dated by the Third Party Auditor. A signed original SoV (not a copy) must be submitted to Alberta Environment.

Worksheet: SoV

8.13 Statement of Certification

The Statement of Certification (SoC) requires the designated Certifying Official of the facility (having the authority to bind the reporting company) to certify that they have reviewed the Compliance Report, and have exercised due diligence to ensure that the submitted data and information are true and complete, and the values and information throughout the Application are accurate, based on reasonable estimates using available data and information. The Statement of Certification must be printed on company letterhead and signed and dated by the Certifying Official. A signed original SoC (not a copy) must be submitted to Alberta Environment.

Worksheet: SoC

8.14 2007 Emission Performance Credit Request Form

The 2007 Emission Performance Credit Request Form requires the designated Certifying Official of the facility (having the authority to bind the reporting company) to certify that the facility has beat its emissions intensity reduction target and is entitled to the calculated number of Emission Performance Credits. The 2007 Emission Performance Credit Request Form must be printed, signed and dated by the Certifying Official. A signed original (not a copy) must be submitted to Alberta Environment. A facility that is entitled to Emission Performance Credits will receive a notice from the Director with the EPC serial numbers that will belong to the facility.

Worksheet: EPC Request

9.0 Data Confidentiality and Access to Information

9.1 Request for Confidentiality

In accordance with Section 16 of the *Regulation*, the Person Responsible may request that certain information in the Compliance Report be kept confidential for a period of up to 5 years on the basis that the information is commercial, financial, scientific or technical information that would reveal proprietary business, competitive or trade secret information about a specific facility, technology or corporate initiative. Figure 6 describes the confidentiality request and evaluation process for the *Specified Gas Emitters Program*.

One confidentiality request with supporting justification and documentation must be submitted for each facility.

Submit the written request, including appropriate justification and supporting documentation, to Alberta Environment by March 31, 2008 by mail or courier at:

Director
Alberta Environment
12th Floor, Oxbridge Place
9820-106 Street
Edmonton, Alberta
T5K 2J6

The Director will notify the Person Responsible in writing of the decision reached within 150 days of receiving the request. While the Director is considering a request for confidentiality, the information in the portions of the application to which the request relates is considered prescribed information.

Under Section 17 of the *Regulation*, the Director must submit a report on confidentiality requests to the Information and Privacy Commissioner, including the number of confidentiality requests received, number of confidentiality requests approved and the period of time prescribed for each approved request.

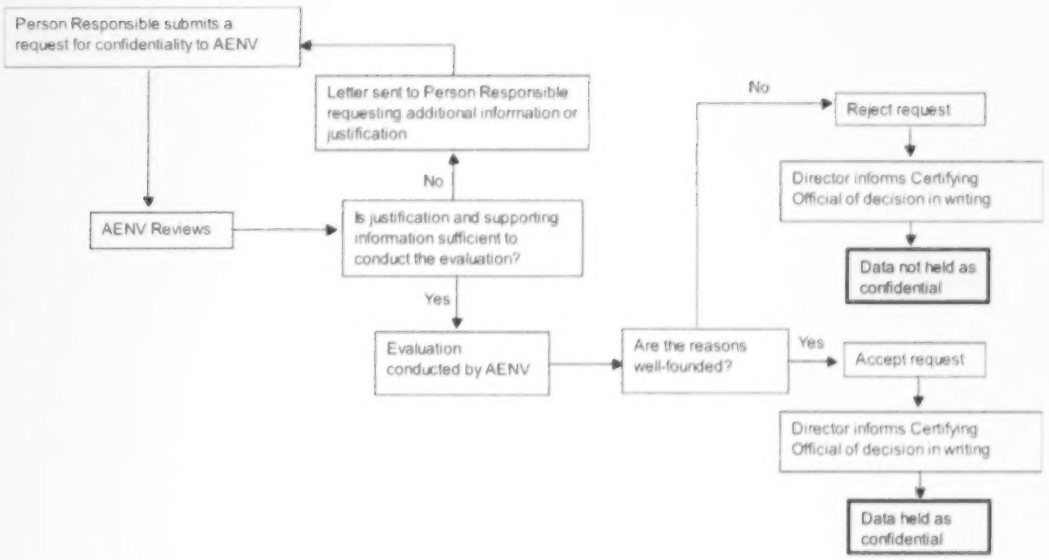
Person Responsible submits a request for confidentiality to AENV
Letter sent to Person Responsible requesting additional information or justification
No
AENV Reviews
Is justification and supporting information sufficient to conduct the evaluation?
Yes
Evaluation conducted by AENV
Are the reasons well-founded?
No
Reject request
Director informs Certifying Official of decision in writing
Data not held as confidential
Yes
Accept request
Director informs Certifying Official of decision in writing
Data held as confidential

Figure 6: Confidentiality Process for the *Specified Gas Emitters Program.*

9.2 Access to Compliance Report Information

The *Climate Change and Emissions Management Act* enables the publishing of prescribed information in aggregated form so that the prescribed information from a particular facility cannot be identified (see Section 59(3) of the *Act*).

Section 14 of the *Regulation* enables the publishing of the non-confidential information contained in the Baseline Application or Compliance Report in any form or manner the Director considers appropriate.

Written requests for information contained in a Baseline Application or Compliance Report that has not been deemed confidential can be made to the Director or the facility that submitted the Application. Figure 7 shows the process for requesting access to information reported under the *Regulation*.

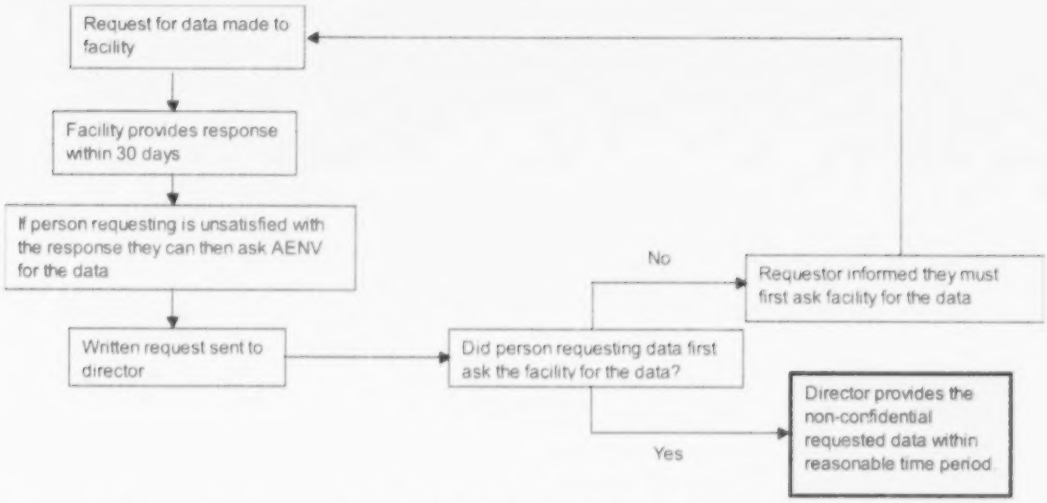
Request for data made to facility
Facility provides response within 30 days
If person requesting is unsatisfied with the response they can then ask AENV for the data
Written request sent to director
Did person requesting data first ask the facility for the data?
No
Requestor informed they must first ask facility for the data
Yes
Director provides the non-confidential requested data within reasonable time period

Figure 7: Process for Requesting Non-Confidential Information Reported Under the *Specified Gas Emitters Regulation.*

10.0 Cogeneration

Note: *This section of the guidance document applies only to stand-alone and integrated cogeneration facilities.*

Alberta Environment acknowledges the environmental benefit associated with the higher energy efficiencies generally afforded by cogeneration operations. To recognize this benefit within the context of the *Specified Gas Emitters Program*, Alberta Environment permits an adjustment to the Baseline Emissions Intensity of cogeneration facilities. This is intended to reduce the overall reduction obligation by a factor that is indicative of the efficiency gains afforded through cogeneration.

The methodology presumes that during the compliance period, the heat was sourced from a conventional boiler operating at an efficiency of 80% and the electricity was produced from an NGCC (Natural Gas Combined Cycle) electricity generation plant with a greenhouse gas intensity of 0.418 tonnes/MWh. Corresponding deemed greenhouse gas emissions for the heat and electricity generation are then calculated using the formula provided later in this section.

It is also assumed that during the compliance periods, cogeneration facilities operate normally and generate electricity at a greenhouse gas intensity of 0.418 tonnes/ MWh. The emissions produced due to steam generation are the difference between actual total emissions from the cogeneration plant minus total emissions attributed to electricity at 0.418 tonnes/MWh.

That is:

If, total emissions from cogeneration plant = G_T
And, emissions attributed to electricity = 0.418* E = D_E
Then, emissions attributed to steam = G_T-(0.418*E) = G_H

Note: *Stand-alone cogeneration facilities that use deemed greenhouse gas emissions must use the 2007 Specified Gas Compliance Report for Stand-alone Cogeneration facilities. Stand-alone cogeneration facilities that did not use deemed greenhouse gas emissions in their Baseline Emissions Intensity Application must use the 2007 Specified Gas Compliance Report for Regular Facilities and should not complete section D (integrated cogeneration information).*

Note: *Integrated cogeneration facilities that used deemed greenhouse gas emissions in their Baseline Emissions Intensity Application Forms must complete section D (integrated cogeneration information) of the 2007 Specified Gas Compliance Report for Regular Facilities. Integrated cogeneration facilities that did not use deemed greenhouse gas emissions must use not complete section D (integrated cogeneration information) of the 2007 Specified Gas Compliance Report for Regular Facilities.*

10.1 Cogeneration Reporting Requirements

Facilities that use deemed greenhouse gas emissions must provide the following information in their 2007 Specified Gas Compliance Report:

- Total greenhouse gas emissions (G_T) in tonnes CO_2e from the cogeneration facility in full-year 2006, full-year 2007 and July 1 – December 31, 2007;
- Fuel used by the cogeneration facility in full-year 2006, full-year 2007 and July 1 – December 31, 2007;
- If fuel factors are used to calculate the greenhouse gas emissions, provide the factors with references;
- If fuel analysis is used to calculate the greenhouse gas emissions, provide a synopsis of the fuel analysis;
- Total heat production (H) in GJ produced by the cogeneration facility in full-year 2006, full-year 2007 and July 1 – December 31, 2007;
- Mass/volume of fuel deemed used to produce heat in full-year 2006, full-year 2007 and July 1 – December 31, 2007;
- Total electricity generation (E) in MWh generated by the cogeneration facility full-year 2006, full-year 2007 and July 1 – December 31, 2007;
- Deemed greenhouse gas emissions from electricity generation (D_E) in tonnes CO_2e in full-year 2006, full-year 2007 and July 1 – December 31, 2007; and

The Person Responsible should also provide the following information either in the comments section of the 2007 Specified Gas Compliance Report or in a separate document:

- Explanation of how heat calculations were done, including the enthalpies;
- Various thermal streams and annualized flow averages, temperature averages, and pressure averages for each stream;
- Simple conceptual/logic diagram of the cogeneration layout; and
- Hours of operation of the cogeneration facility in full-year 2006, full-year 2007 and July 1 – December 31, 2007.

10.2 Greenhouse Gas Emissions from Cogeneration

As a first step the Person Responsible must calculate the total annual greenhouse gas emissions from the cogeneration operation. This is calculated using the equation:

$$G_T = f \times M_F$$

Where:

G_T	=	Total greenhouse gas emissions from the cogeneration facility for the year/half-year	[tonnes CO_2e]
f	=	Emission factor for the fuel used in the cogeneration facility	[units of fuel used]
M_F	=	Mass/volume of fuel used in the cogeneration facility during the year/half-year	[units of fuel used]

The Person Responsible may choose to:

1) Calculate site-specific emission factors for the fuel used in the facility based on the compositional analysis of the fuel. If this method is used, the Person Responsible should report the detailed fuel analysis and calculation procedures used to develop the emission factor.
2) Use an industry standard emission factor. If this method is used, the Person Responsible should provide references for the source of the emission factor.

10.3 Deemed Greenhouse Gas Emissions for Electricity Generation

10.3.1 Measure the Total Electricity Generated by the Cogeneration Facility

The Person Responsible will measure the total amount of electricity (gross) generated by the cogeneration facility. This value will cover all electricity from the facility including electricity used by the heat host, if any. This methodology makes no distinction between electricity used within the heat host's process and that exported to the Alberta electricity grid.

10.3.2 Calculate the Deemed Greenhouse Gas Emissions for Electricity Generation

In this step the Person Responsible will determine greenhouse gas emissions based on a NGCC turbine with a deemed greenhouse gas emission intensity of 0.418 tonnes/MWh.

$$D_E = 0.418 \times E$$

Where:

D_E	=	Deemed greenhouse gas emissions from electricity generation	[tonnes CO_2e]
E	=	Total electricity generation by the cogeneration facility during the year/half-year	[MWh]

Note: *Greenhouse gas emissions from the generation of electricity from stand-alone and integrated cogeneration units are excluded from THYE but the sources, estimation methods and calculations must still be examined by the Third Party Auditor.*

10.4 Greenhouse Gas Emissions for Heat Generation

10.4.1 Calculate the Greenhouse Gas Emissions for Heat Production

In this step the Person Responsible will calculate the greenhouse gas emissions attributed to heat production by subtracting the deemed greenhouse gas emissions for electricity generation from the total greenhouse gas emissions (G_T) from the cogeneration plant.

$$G_H = G_T - D_E$$

Where:

G_H	=	Emissions attributed to steam production	[GJ]
D_E	=	Deemed greenhouse gas emissions due to electricity generation by the cogeneration facility during the year/half-year (= 0.418* E)	[GJ]
G_T	=	Total greenhouse gas emissions from the cogeneration facility during the year/half-year	[GJ]

10.5 Net Emissions Intensities

This section describes the calculation of the emissions intensity for integrated and stand-alone cogeneration facilities. Integrated cogeneration units may have multiple products depending on the type of operations that occur at the facility. Production for these facilities does not include electricity generated by integrated cogeneration units.

Stand-alone cogeneration facilities produce two products: heat and electricity; however, the emissions intensity is based only on heat.

10.5.1 Integrated Cogeneration Facility

For facilities with integrated cogeneration units, the deemed intensity for the electricity generation will remain the same and greenhouse gas emissions attributed to the heat production will be added to the total greenhouse gas emissions from the host facility (excluding emissions attributed to electricity generation from the integrated cogeneration unit). The following formula is used:

$$NEI = \frac{THYE - D_E}{P}$$

Where:

NEI	=	Net emissions intensity for the compliance year.	[tonnes CO_2e / MWh]
THYE	=	Total Half Year Emissions from the entire facility for the compliance period. ***(excluding:*** *GHG emissions from industrial process, CO_2 emissions from combustion of biomass and CO_2 emissions from aerobic decomposition of waste but including emissions from the cogeneration unit).*	[tonnes CO_2e]
D_E	=	Deemed greenhouse gas emissions from electricity generation for the compliance period.	[tonnes CO_2e]
P	=	Production for the compliance period.	[appropriate units of production]

10.5.2 Stand-Alone Cogeneration Facility

For stand-alone cogeneration facilities (as per the facility definition within the *Regulation*) the emission intensity for the compliance period is calculated using the following equation:

$$NEI = \left[\frac{G_T - D_E}{H}\right]$$

Where:

NEI	=	Net Emissions intensity for the compliance period.	[tonnes CO_2e / GJ]
D_E	=	Deemed greenhouse gas emissions attributed to electricity generation for the compliance period	[tonnes CO_2e]

H	=	Total heat produced by the cogeneration facility during the compliance period.	[GJ]

10.6 Significant Change in Cogeneration Unit Operation

Consideration will be given to any changes over time made to the production of heat and electricity from the cogeneration operation. If, in future, the cogeneration facility changes its operations such that there is no longer a material production of one of the energy products, all or part of the Cogeneration Adjustment may be removed, and the facility will be treated as a non-cogen facility in future Compliance Reports.

Clarification: *This situation could arise if the cogeneration facility is associated with an operation that decreases its take of energy from the cogeneration plant.*

Glossary of Terms

Act means the *Climate Change and Emissions Management Act* (source: *Specified Gas Emitters Regulation*).

Actual emissions intensity means total annual direct emissions, excepting industrial process emissions, CO_2 emissions from combustion of biomass, and CO_2 emissions from aerobic decomposition of waste per unit of production from a facility.

Assurance means the level of comfort a Third Party Auditor provides to validate a facility's compliance report. Alberta Environment requires limited assurance for *Specified Gas Emitters Regulation* compliance reports.

Audit means an independent assessment performed to ascertain the validity and reliability of information, system controls, and performance. Under the *Specified Gas Emitters Regulation*, Alberta Environment will conduct an audit review on a number of compliance report submissions received each year.

Baseline emissions intensity means the baseline emissions intensity of a facility established in accordance with Part 4 of the *Specified Gas Emitters Regulation* (source: *Specified Gas Emitters Regulation*).

Biomass means plant materials, animal waste or any product made of either of these and includes without limitation: wood and wood products; charcoal; agricultural residues and wastes including organic material above and below ground, both living and dead, such as trees, crops, grasses, tree litter, and roots; municipal and industrial wastes where the organic material is biological in origin; landfill gas; bio-alcohols; black liquor; sludge gas; and animal or plant-derived oils (source: *Specified Gas Reporting Standard – March 2007*).

Biomass emissions mean the direct emissions from the combustion of biomass (source: *Specified Gas Reporting Standard – March 2007*).

Climate Change and Emissions Management Fund means the fund with that name established by the *Act* (source: *Specified Gas Emitters Regulation*).

CO_2e means the 100-year time horizon global warming potential of a specified gas expressed in terms of equivalency to CO_2 set out in the Schedule in the *Specified Gas Emitters Regulation* (source: *Specified Gas Emitters Regulation*).

Direct emissions means the release of specified gases from sources actually located at a facility expressed in tonnes CO_2e (source: *Specified Gas Emitters Regulation*).

Emission offset means a reduction in the release of specified gases, expressed in tonnes on a CO_2e basis, that meets the requirements of section 7(1) of the *Regulation*, but does not include an emission performance credit (source: *Specified Gas Emitters Regulation*).

Emission performance credit means a reduction in the release of specified gases, expressed in tonnes CO_2e, that meets the requirements of section 9(1) of the *Regulation* (source: *Specified Gas Emitters Regulation*).

Emissions intensity means the quantity of specified gases released by a facility per unit of production from that facility (source: *Specified Gas Emitters Regulation*).

Established facility means a facility that completed its first year of commercial operation prior to January 1, 2000, or has completed eight consecutive years of commercial operation (source: *Specified Gas Emitters Regulation*).

Facility means any plant, structure or thing where an activity listed in section 2 of the Schedule of Activities to the *Environmental Protection and Enhancement Act* occurs, and a site, or one or more contiguous or adjacent sites, that are operated and function in an integrated fashion where an activity listed in any of sections 3 to 11 of the Schedule of Activities to the *Environmental Protection and Enhancement Act* occurs including all the buildings, equipment, structures, machinery and vehicles that are an integral part of the activity (source: *Specified Gas Emitters Regulation*).

Flaring emissions means direct emissions from the controlled combustion of a gas or liquid stream produced on site not for the purpose of producing energy and includes without limitation emissions arising from waste petroleum incineration, hazardous emissions prevention systems (whether in pilot or active mode), well testing, natural gas gathering systems, processing plant operations, crude oil production, pipeline operations, petroleum refining, and chemical fertilizer and steel production (source: *Specified Gas Reporting Standard – March 2007*). CO_2 emissions from the combustion of landfill gas are not included in flaring emissions but are included in the CO_2 Emissions from the Combustion of Biomass source category. CH_4 and N_2O emissions from the combustion of landfill gas must be reported in the Waste and Wastewater source category.

Fund means the Climate Change and Emissions Management Fund established by the *Climate Change and Emissions Management Act* (source: *Specified Gas Emitters Regulation*).

Fund credit means a fund credit described in section 8 of the *Specified Gas Emitters Regulation* (source: *Specified Gas Emitters Regulation*).

Global warming potential (GWP) is the relative measure of the warming effect that the emission of a specified gas might have on the Earth's atmosphere calculated as the ratio of the time-integrated radiative forcing that would result from the emission of one kilogram of a specified gas to that from the emission of one kilogram of carbon dioxide (source: *Specified Gas Reporting Standard – March 2007*).

HFC Species means CHF_3, CH_2F_2, CH_3F, $C_5H_2F_{10}$ (structure: $CF_3CHFCHFCF_2CF_3$), C_2HF_5, $C_2H_2F_4$ (structure: CHF_2CHF_2), $C_2H_2F_4$ (structure: CH_2FCF_3), $C_2H_3F_3$ (structure: CHF_2CH_2F), $C_2H_3F_3$ (structure: CF_3CH_3), $C_2H_4F_2$ (structure: CH_3CHF_2), C_3HF_7 (structure: CF_3CHFCF_3), $C_3H_2F_6$ (structure: $CF_3CH_2CF_3$) and $C_3H_3F_5$ (structure: $CH_2FCF_2CHF_2$) (source: *Specified Gas Reporting Standard – March 2007*).

Industrial process emissions means direct emissions from an industrial process involving chemical or physical reactions other than combustion, and where the primary purpose of the industrial process is not energy production (source: *Specified Gas Emitters Regulation*).

Industrial product use emissions means direct emissions from the use of a product that does not react in the process and includes, without limitation, SF_6 and HFC use as a cover gas and use of SF_6 in electrical equipment (source: *Specified Gas Reporting Standard – March 2007*).

Limited Assurance means a conclusion based on the identification of anomalies. It is made by the Third Party Auditor and states that, based on their work, nothing has come to their attention that causes them to believe that the GHG statement is not, in all material respects, in accordance with the approved quantification protocols.

Net emissions intensity means the net emissions intensity for a facility determined in accordance with section 3(4) or 4(3) of the *Specified Gas Emitters Regulation* (source: *Specified Gas Emitters Regulation*).

Net emissions intensity limit means the applicable maximum net emissions intensity permitted under section 3 or 4 of the *Specified Gas Emitters Regulation* (source: *Specified Gas Emitters Regulation*).

New facility means a facility that completed its first year of commercial operation on or after December 31, 2000, or in a subsequent year, and has completed less than eight years of commercial operation, or a facility designated as a new facility under subsection (2) of the *Specified Gas Emitters Regulation* (source: *Specified Gas Emitters Regulation*).

On-site transportation emissions means direct emissions resulting from fuel combustion in machinery used for the on-site transportation of products and material integral to the production process (source: *Specified Gas Reporting Standard – March 2007*).

Other fugitive emissions means direct emissions that do not fall under stationary fuel combustion emissions, industrial process emissions, venting emissions, flaring emissions, on-site transportation emissions, waste and wastewater emissions, vented raw gas emissions, CO_2 emissions from the combustion of biomass, or CO_2 emissions from aerobic decomposition and includes, without limitation, intentional or unintentional

releases of gases arising from the production, processing, transmission, storage, and use of solid, liquid or gaseous fuels.

Person Responsible means, where the release of the specified gas occurs at a facility that is the subject of an approval or registration under the *Environmental Protection and Enhancement Act*, the holder of the approval or registration; at a facility that is not the subject of an approval or registration referred to in subparagraph (i) but is the subject of an approval or other authorization issued by the Alberta Energy and Utilities Board, the holder of that approval or authorization; at any other facility, the owner of the facility (source: *Specified Gas Emitters Regulation*).

PFC species means CF_4, C_2F_6, C_3F_8, C_4F_{10}, c-C_4F_8, C_5F_{12}, and C_6F_{14} (source: *Specified Gas Reporting Standard – March 2007*).

Production means the quantity, expressed in the applicable unit of production, of end product produced by a facility, or any input, output or other thing specified under subsection (4) of the *Regulation* (source: *Specified Gas Emitters Regulation*).

Regulation means the *Specified Gas Emitters Regulation* (source: *Specified Gas Emitters Regulation*).

Specified gas means a gas listed in the Schedule in the *Specified Gas Emitters Regulation* (source: *Specified Gas Emitters Regulation*).

Stationary fuel combustion emissions means direct emissions resulting from non-vehicular combustion of fossil or biomass fuel for the purpose of producing energy but does not include CO_2 emissions from the combustion of biomass (source: *Specified Gas Reporting Standard – March 2007*).

Total annual emissions means total direct emissions in a year, not including industrial process emissions, CO_2 emissions from combustion of biomass, and CO_2 emissions from aerobic decomposition of waste.

Total direct emissions means the release of specified gases from sources actually located at a facility expressed in tonnes on a CO_2e basis (source: *Specified Gas Emitters Regulation*).

Third Party Auditor means a person who meets the requirements set out in section 18 of the *Regulation* (source: *Specified Gas Emitters Regulation*).

Third Party Auditor's Report means the report generated by the Third Party Auditor that contains the results of the Auditor's verification including, but not limited to, relevant emissions sources, audit procedures, a Statement of Verification, and supporting documents. Information on the Third Party Auditor's report is available in Section 7.4.2.

Total half year emissions means total direct emissions in the period July 1, 2007 to December 31, 2007, not including industrial process emissions (source: *Specified Gas Emitters Regulation*).

Unit of production means the unit of measure of production unique to the type of facility as approved or determined by the Director in establishing a baseline emissions intensity for the facility under Part 4 of the *Specified Gas Emitters Regulation* (source: *Specified Gas Emitters Regulation*).

Vented raw gas means direct emissions of carbon dioxide that is recovered, or is recoverable, at a well from an underground reservoir, and that is gaseous at the conditions under which its volume is measured or estimated. This source category includes, but is not limited to, CO_2 emissions vented from gas sweetening and formation gas (source: *Activities Designation Regulation (modified)*).

Venting emissions means direct emissions from intentional releases to the atmosphere of a waste gas or liquid stream and includes, without limitation, emissions of casing gas, treater, stabilizer, dehydrator off-gas, blanket gas, and emissions from pneumatic devices which use natural gas as a driver, compressor start-up, pipeline and other blowdowns, and metering and regulation station control loops, but does not include vented raw gas emissions (source: *Specified Gas Reporting Standard – March 2007*).

Verification means an independent, third party review of a facility's annual compliance report to provide Alberta Environment a limited level of assurance that the numbers reported in the compliance report are true and correct, based on the information available.

Waste and wastewater emissions means direct emissions from disposal of waste and waste or wastewater treatment and includes, without limitation, sources of emissions from on-site waste disposal and waste or wastewater treatment at a facility such as landfilling of solid waste, flaring of landfill gas, treatment of liquid waste, and waste incineration, but does not include CO_2 emissions from aerobic decomposition of waste (source: *Specified Gas Reporting Standard – March 2007*).

Year means calendar year unless otherwise specified in the *Specified Gas Emitters Regulation* (source: *Specified Gas Emitters Regulation*).

References

Activities Designation Regulation. Alberta Environment, Government of Alberta.

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